

NORTH AMERICAN

# SKYLINE



VOLUME THREE

*March, 1942*

NUMBER TWO



TO KEEP 'EM FLYING  
GET 'EM BUILT!







### WE'RE MAKING TWO CONTRIBUTIONS

**T**HOUSANDS of employes at the plants of North American Aviation are in their daily work making a tremendous contribution to the war effort of the United Nations by building B-25 bombers, Mustang pursuits, and Harvard training planes. For this reason, it is all the more gratifying for SKYLINE to be able to present in this issue an article telling of the immediate and hearty response which greeted the company's voluntary payroll deduction plan for buying United States defense savings bonds.

A large majority of North Americans at Inglewood, Dallas, and Kansas City have begun the systematic purchasing of defense bonds, thereby simultaneously protecting their own financial futures and helping their government to pay the check for the planes, tanks, guns, rifles, and fighting men being turned out in America's all-out war effort.

Many of the other March articles, in keeping with SKYLINE's policy, deal with the work of departments at the three plants, with a view to giving employes a clearer picture of how their individual jobs fit into the larger task before us. Among these is the story telling what sort of people test pilots actually are and what the real nature of their work is.

The story of Mrs. Francis Sauve, who lived in Sumatra with her husband before the war and now helps build NAA planes at Dallas while he serves as an Army officer in the Far Eastern theater, is one which we feel portrays the spirit which will win this war for the United Nations.

### THE COVER

**T**HIS MONTH'S cover picture might have been taken over the English channel coast, for North American Mustangs, one of which is shown here in the camouflage of the R. A. F., are being manufactured for the British. Actually, however, the ship was photographed in Kodachrome by SKYLINE Photographer Sher-

wood Mark as it cruised swiftly above the clouds of Southern California. This, the original Mustang, designated the NA-73, was designed for the R. A. F. With minor modifications, it has been accepted by the U. S. Army Air Forces as the P-51. The Allison-powered pursuit's trim lines and sleek streamlining are indicative of its high performance. On the inside front cover, North Americans from departments throughout the Inglewood plant go into a huddle, graphically illustrating the spirit of cooperation that "gets 'em built." The Red Cross poster on the back cover is the work of Eric G. Michelson, NAA staff artist at Inglewood.



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# They're No Longer Glamour Boys

## Unlike Those in Movies, Test Pilots at NAA Are Hardworking Engineers

THE test pilot of yesterday took a new ship up to its ceiling, fell off on one wing, pointed the nose straight down until the sound of the wind rushing through the guy wires rose to a piercing shriek, and then pulled back on the stick, hoping to hit 9 G's in the pull-out and praying to God that the wings wouldn't fall off.

That test pilot, a dashing, devil-may-care fellow, still exists—but only in fiction and the movies. The real-life test pilot of today, of whom the North Americans pictured on this page are representative, is no longer a reckless daredevil. Rather, in his own words, he is a “hard working engineer.”

The men who today fly the prototypes of tomorrow's airplanes do not try to pull a plane apart in the air. They know that modern planes will hold together. Instead, they fly according to a carefully charted flight plan, while a multitude of instruments record the answers to questions propounded by the engineers who designed the ship.

Of course, today's test pilots still dive planes, but the object is no longer to test the structural strength of the plane. Rather, it is to see whether any vibration



*These are the men who fly the prototypes of all North American models. From left to right, they are Bob Chilton, Ed Virgin, Chief Test Pilot Lou Wait, and Paul Penrose.*

or “flutter” is encountered at extremely high speeds. Also, the former Army requirement of a 9-G pull-out has been reduced to  $7\frac{1}{2}$  or 8 on a new model. (The term “9-G” means that in the sudden change of direction involved in pulling out of a fast dive the downward pull on the pilot and plane becomes equal to nine times the normal pull of gravity. In effect, in a 9-G pull-out, a 200-pound pilot suddenly finds himself weighing 1,800 pounds, there is a tendency for the blood to be drawn to the lower parts of the anatomy, and the result is frequently loss of consciousness.)

The men who fly North American's new models are Lou Wait, chief test pilot; Ed Virgin, bomber test pilot; Bob Chilton, pursuit test pilot; and Paul Penrose, pursuit and trainer test pilot. The quartet are members of the engineering flight test department at the Inglewood plant. Others on the staff are Engineers Roy Ferren, William Eichleay, and James Talman, and Secretary Madeline Mack.

Engineering flight test, which flies new models and types for all three plants, is not to be confused with production flight test, which handles the testing of planes coming off the production line.

### Tests Already Made

Before a new plane gets to engineering flight test, North American's engineers already have a good idea of how it will act in the air. Tests on its component parts have shown that each is structurally strong enough, and to a certain extent that its design and construction is such that no vibration will develop. Wind tunnel tests have given a picture, accurate within a few per cent, of what the ship's performance will be.

But all of these findings are subject to some error and others—such as how the plane will react in aerobatics and at extremely high altitudes, and what vibra-

*This is the B-25, North American's high performance medium bomber, over mountains in Southern California.*





neer, is in charge of this work. Eichleay and Talman spend most of their time interpreting test instrument readings and putting their findings into usable form for engineering.

The first testing done on the plane is on the ground. A new model is taxied to test the ground controls—particularly the brakes, which are vitally important with today's fast ships—and generally "to get the feel of the ship."

Formerly, "ground-hopping" came next. This was the practice of taking a plane five or ten feet up and immediately bringing it down. In the days of slower ships, this was perfectly feasible. Now, with super-fast military craft, few runways are long enough to permit this procedure. Once a plane takes off, on most fields it must keep going up. In the case of a radically new design, however, test pilots look for a large field and go back to ground-hopping because of the safety factor involved.


The actual test flying is a precision job. Engineers want readings at specific speeds, at specific altitudes, and in speci-

tional response will arise from engine and air stresses—can not be determined without actual flight testing.

So the plane is turned over to the engineering flight test department. With it come many "test requests." These list the things various groups in the engineering department want to know. Each plane will have requests from power plant, aerodynamics, equipment, hydraulic, landing gear, and other engineering groups.

Next, before the actual flight testing can begin, the test requests and any other problems in which flight test itself is interested are worked into a master flight plan for the plane. The master flight plan in turn is broken down into separate plans for each flight, telling the pilot what maneuvers he is to execute.

Before the first of these flights, a period of from a week to a month is spent in installing special test instruments which will give the answers to the engineering department's questions. Fern, flight test's instrumentation engi-



*Test Pilot Bob Chilton puts the fast North American pursuit through its paces. As shown here in the camouflage of the Royal Air Force, the plane is known as the NA-73 Mustang. A slightly modified version for our own Army Air Corps has been named the P-51 Mustang. All performance figures on this speedy ship are still secret.*





*Mechanic Lawrence Sennett makes a final check with Test Pilot Paul Penrose before a test flight in the Mustang.*



*Test Pilot Ed Virgin, left, and Engineer Roy Ferren are seated in the "office" of a B-25 Mitchell bomber.*



*Pursuit Pilot Bob Chilton, in the cockpit, and Chief Test Pilot Lou Wait watch another plane take off.*

fic maneuvers. It is the test pilot's job to produce exactly the conditions prescribed in the flight plan. In doing this, Wait says, a highly trained pilot can fly for five or ten minutes without varying more than a few feet in altitude. Any pilot needs a good sense of the feel of the controls; in the test pilot, this sense must be perfect.

The modern test pilot no longer carries a note pad with him on which to jot down instrument readings from time to time. Instead, he merely pulls a trigger, and a camera records the readings of all the regular flight and engine instruments, plus several special ones for testing purposes. The photographic instrument recorder can take as many as 10 photos a second of the complete instrument panel. The films are projected in

the office, and the engineers have, in effect, the instrument panel directly before them.

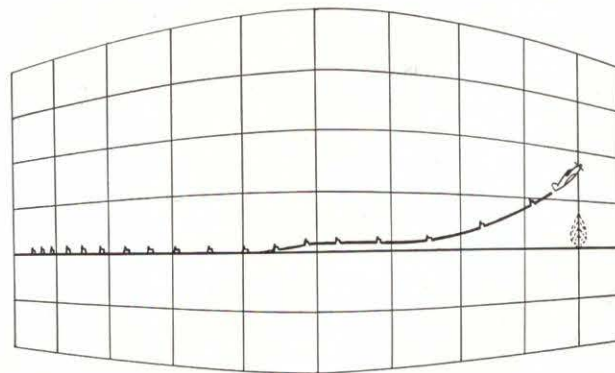
Another interesting device is the recording theodolite, which is used in determining takeoff and landing characteristics. The theodolite is essentially a telescope with a device for charting its movement. The operator picks a point on the plane, such as the wheels, trains the crosshairs of the telescope on the point, and follows the plane as it takes off or lands. A stylus attached to the telescope marks a stationary chart, giving, for a takeoff, a level line which gradually curves upward. The theodolite also determines speed, through a kicker on the recording stylus which causes a break in the line every half second. The space between the breaks

will naturally vary with the speed of the plane.

Airspeed indicators are calibrated by means of a photo-electric speed course setup. Two vertical photo-electric beams are set up a known distance apart and connected to a timer. The plane flies over the course, and the device times it. From the time and distance, the ground speed can be computed, and after correction for wind, the airspeed which the indicator in the plane should register.

Flight testing on a new model can last from a few days to several months. The length of time needed depends to a large extent on the degree of change from the previous model of the same type. Variations of the same basic design—designated by adding new suffixes

*(Turn to Page 32)*



*The strange device on the left is a recording theodolite, operated by Bill Eichleay while Jim Talman takes notes. Both men are flight test engineers. The chart above is a representation of that on which the theodolite's stylus is tracing the takeoff path of a plane. The horizontal and vertical divisions mark off known distances and the "teeth" in the airplane's path mark definite periods of time. From these facts, the speed of the plane at any point, the time of takeoff, and the rate and angle of climb can be readily determined.*



# Gone is the clinging vine

## Women in NAA Shops Make Good At What Once Were Men's Jobs

THE DIEHARDS who have always felt that woman's place is in the home have had some rather unhappy moments in the past few decades, but they have persisted in their belief that a woman and a kitchen should remain inseparable. Now they might just as well give up the ghost. Women have invaded the aircraft plants, even the machine shops, and it would cause no great surprise to see a member of the fair sex operating a huge drop hammer in the near future.

At North American's plants in Inglewood, Dallas, and Kansas City, thousands of women are now helping to build bombers, pursuits, and trainers. More are being hired every day, for those already employed have proved that a woman can do as good a day's work in the shop as a man can—perhaps, in some jobs, a better day's work.

### Shortage of Men

The women are vitally important to defense industry, for the demand for added personnel — caused by the increased production needs of the United States and her Allies—coincides with the manpower demands of our armed forces. With more workers needed, and less men available, the nation looks more and more to the women to man the machines of industry.

Hiring of women began several months ago at North American's Dallas plant and was pronounced an immediate success. The first feminine shop workers were placed in jobs which called for much the same manual dexterity as housework. From minor repairs on household appliances, it was but a short step to small sheet metal and hydraulic assembly.

The women of Texas, who at the Alamo had manned muskets, proved just as effective when they manned airplane machinery in 1941.

Next, in January, the women began to branch out at the Inglewood plant, where they had already been covering and sew-

ing the control surfaces of airplanes. The first new women hired were assigned to electrical sub-assembly, where their ability to use their hands in small, detailed work soon made them efficient at putting together small switch parts and complicated wiring.

Finally, the hiring of women reached North American's newest unit, the Kan-



sas City bomber assembly plant. There, feminine employees went to work as stock room clerks and a training program was begun to make them semi-skilled workers.

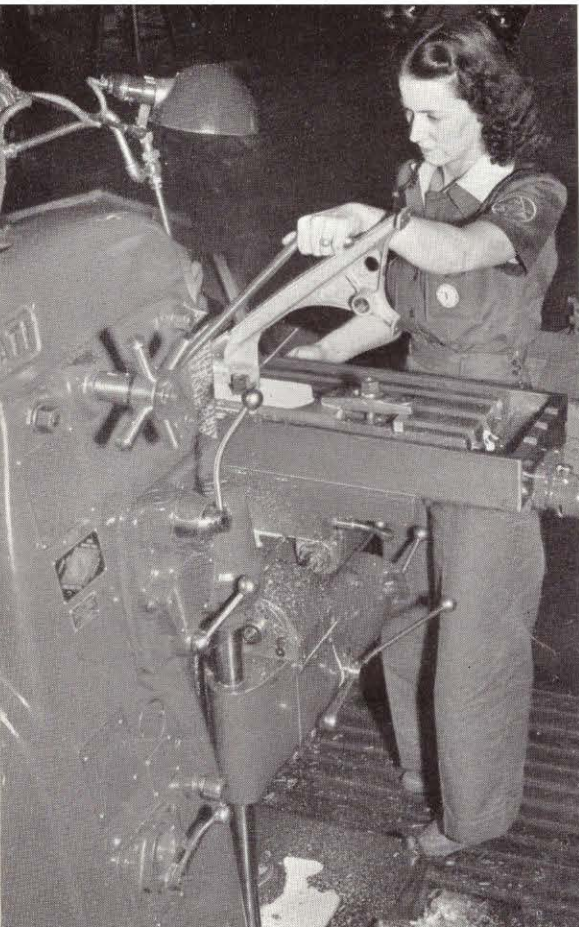
Since then, women workers have spread through the shops, until today you will find them running drill presses and milling machines or driving rivets home. At no time, however, will women displace men, company officials point out. They are being hired for two main reasons. First, they are replacing men who have volunteered or been called into service with our fighting forces. Secondly, they are making it possible to release men to other departments where they are more urgently needed at the present time.



*Most feminine workers at North American plants, like the four pictured on this page, are working on small parts and sub-assemblies. Leona Romano, above, is bending tubing at the Inglewood plant. At left, Jerry Lassiter and Ada Gordon, right, both working in a factory for the first time in their lives, are busy in the Dallas plant's sub-assembly department. Mary Frances Morrison, below, is operating a hand drill at Dallas.*







*At left, Bernardine Perry of the Inglewood machine shop proves that there is no double standard in the aircraft industry by operating a big milling machine.*

*Lozelle Mayfield, right, wires instruments at the Dallas plant. Miss Mayfield was a hat trimmer before she began work at North American's Texas plant.*



shops, the problem of suitable work clothes arose. The company decided upon uniform blue slack suits, which have recently been issued at all three plants. Like all women, however, those at NAA are individualists, and bright sweaters beneath the blue jackets, matching hair ribbons and handkerchiefs, and the many different coiffures are constant reminders of this trait.

All are agreed that the slack suits are much more practical than skirts, with their solution to the hosiery problem ranking high among their advantages.

When the company was contemplating hiring women for the shops, there were skeptics who held that both men and women would be a bit self-conscious and ill at ease. As the plan has worked out, however, the women have been accepted simply as fellow-workers, and have acted accordingly, quickly settling down into the new routine.

For many women, the building of airplanes was a radical departure from former pursuits. Among the women working with small metal parts in the Dallas sub-assembly department, for example, is Dorothy Proctor, who was graduated from the Texas State College for Women last June with a diploma and a certificate entitling her to teach art in the public schools of Texas.

To friends who ask her why an education major should take a job in the shops of an aircraft plant, Dorothy says, "I guess I have always liked the unusual, and this, I knew, would not only be different from anything I had ever done before, but also I would have the satisfaction of knowing that I was really doing work of importance in the war."

Another Dallas shop woman is Mrs. Oswald Jacoby, wife of the bridge expert and a tennis star and master of the card game in her own right. Mrs. Jacoby, who wanted to be doing "something in which I can see the results of my work actually going into the war against the enemy," is investing all her earnings in defense bonds. Her husband is now in Washington with the war production board, while Mrs. Jacoby and their two sons continue to live in Dallas, her native city.

The women have been told that they are working in the industry on an equal basis with the men and that they will get no extra consideration and no unusual privileges. That is the way the women want it.

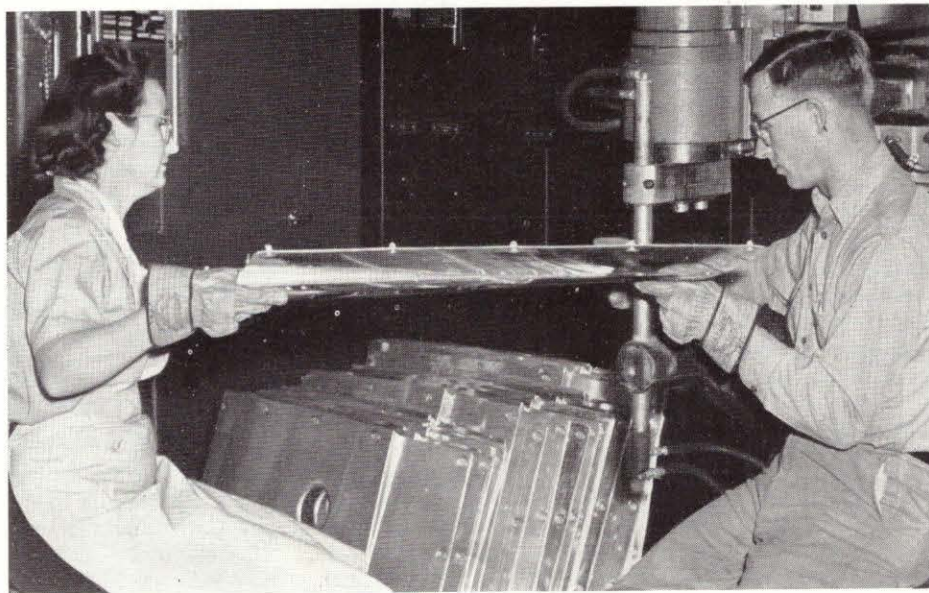
North American's women workers have been drawn from all walks of life. There are former sport champions, waitresses, artists, housewives, interior decorators, students, singers, and office workers. Some have been drawn to aircraft work because of better wages, some because of the romantic appeal which the airplane still holds.

But a good share of them were drawn by stronger motives. These women are the wives, sisters, and sweethearts—and in some cases widows—of men in our Army, Navy, Marines, and Air Forces. Each, by helping to build fighting planes, is doing her bit to aid her man in the fight before us. That thought drives each rivet home a little harder.

"Our biggest concern to date," one foreman disclosed, "has been to keep the women from becoming over-anxious. We tell them to take it easy for a while, and not to rush and worry about their work. We advise them to imagine that they are in the kitchen baking a cake or washing dishes, and to take hold of their jobs in the plant in the same manner as they hold their jobs at home."

When women went to work in the

*This is a new version of the ancient "boy meets girl" story. Here Maudie Ruth Arthur and Joseph Haas, Dallas spotwelders, demonstrate once again that one man and one woman make an excellent team.*





# Army Wings Over the Gulf



PHOTO BY SOUTHEAST AIR CORPS TRAINING CENTER

**T**HE training schedule for cadets of the Advanced Flying school, Craig field, Selma, Alabama, calls for two weeks of gunnery practice at Eglin field, Florida. There on the shores of the Gulf and in the surrounding everglades, remote from civilian habitation, the young war birds undergo intensive indoctrination in this wholly new phase of training.

From morn till nightfall, planes land and take off with fresh supplies of gasoline and ammunition for practice shooting at stationary ground and moving aerial targets.

For the cadet, good performance is a matter of personal pride. It may mean a great deal more to him later, to have learned these basic target practice lessons well. The pilots of Craig field, an advanced pursuit training school of the Southeast Air Corps training squadron, may later depend upon their guns for self-preservation and to protect bombers that they accompany.

Preparation for the trip to Eglin begins days before the first truck or plane leaves. Guns must be mounted on the North American AT-6A's, and each carefully proof-fired to assure alignment with the sights. The guns are fixed rigidly to fire through the propeller over the nose. Improper sighting, of course, will ruin the chances of making a good score.

To insure proper alignment, one of two methods may be used. The gun can be bore checked by mathematical computation, relating the sights and guns, or it may be tested by firing while the plane is still on the ground.

In the latter procedure, the tail of the plane is jacked up in flying position so that the guns fire into a bank at one end of the flying field. By manipulating the plane, the cross hairs of the sight are centered on a target in the bank, and the triggers held down for a short burst so that adjustments can be made to assure that the bullets hit the bullseye. At Eglin field, the cleaned, repaired, and adjusted guns receive the acid test.

Targets set upon piles constructed in the water are "ground targets," and the shots falling around them are easily spotted by the splashes they make. In drawing a bead on a target, the cadet must learn to aim the entire plane in order to bring his stationary guns to bear. This intricate and delicate procedure is difficult at first, even with stationary targets, and still greater skill must be developed to score on moving objects.

In preparation for firing on a moving muslin sleeve, dragged through the air at the end of a cable attached to a towing plane, the cadet spends con-

*A flying cadet pulls out of his dive after firing a burst into the target on the end of the dock.*

siderable time on the skeet range breaking clay pigeons.

All the enlisted personnel necessary to service the planes and machine guns is moved by convoy from the home field and installed at Eglin. The spirit of competition among ground crews is strong, and each man does his job with spirit to make his plane score the greatest number of hits in the day. Punctures in the tow targets and the ground bullseyes are the proof, and the bullet holes are counted with pride. This is the spirit that will "Keep 'Em Flying" no matter what the future holds.

*An enlisted man loads an AT-6A with fresh ammunition at Eglin field.*

PHOTO BY SOUTHEAST AIR CORPS TRAINING CENTER





# Protection Department Safeguards Plant and Workers

## Blackout Procedure, Plant Policing, Fire Prevention And Fighting Are Its Duties

**W**ELL ACCUSTOMED to being courts of last resort, the plant protection departments at each of North American's three plants hold themselves ready to shoulder almost any kind of job, from directing traffic to seeing that old blueprints are properly destroyed.

Before war came to the Americas, to use the Inglewood department as an example, the activities of plant protection embraced the work of the police and fire departments, investigation of reports of sabotage, espionage, and theft, handling fingerprint records, cooperating with military and civil authorities in matters affecting the company, and in general supervising the myriad details incident to protecting the interests of both employees and the company.

### War Added New Duties

The advent of hostilities imposed upon the Inglewood department the responsibility of seeing that within three or four minutes all evidence of the factory's existence could be blotted from the face of the earth, plus completing preparations to meet possible havoc. Within a few days, the deed was done, down to the minutest detail which could be foreseen.

First on the program was the establishment of a central command office, in cooperation with Army authorities, to channelize all information and orders



*At left, two Dallas NAA policemen permit a North American trainer to be towed through the gate leading from the plant to the airport. Directly below, seated at his desk in Inglewood, is A. R. Miller, protection director for all three plants. At the lower left is the police office at the California plant. Standing are Sergeants R. L. Teal, left, and A. R. Daggett, while behind the desk are Sergeant R. F. Tucker and Officer J. W. Jacoby, seated at the switchboard.*

in event of an emergency. Equipped with a battery of direct-line telephones, these headquarters are a veritable nerve-center of emergency precautions. Here, too, are the microphones through which instructions may be sent to all corners of the plant over the loudspeaker system. Three of the direct telephone lines lead outside; others connect the command office with plant police headquarters, the maintenance department, and the office of Capt. S. R. Barker, resident Air Corps representative at Inglewood.

Worthy of emphasis is the fact that the general West Coast rule of "no more practice blackouts" applies with equal force to the Inglewood plant. Any



blackout orders henceforth will be in response to genuine emergencies proclaimed by the Fourth Interceptor Command. Similarly, the plant will not be blacked out for "alerts," or upon mere sighting of unidentified aircraft, except at specific direction of the military.

Blackout orders will come to the command office from the Fourth Interceptor Command through the Western District Office, Materiel Division, United States Army Air Corps. In the event of a threatened air raid, all vital defense industries will be notified at once. It is expected that the warning will allow at least three or four minutes for precautionary measures.

### Plant Is Safest Place

Plans have been perfected for evacuation of the Inglewood plant, should this prove advisable, with a minimum of delay and confusion. According to the best information, however, garnered

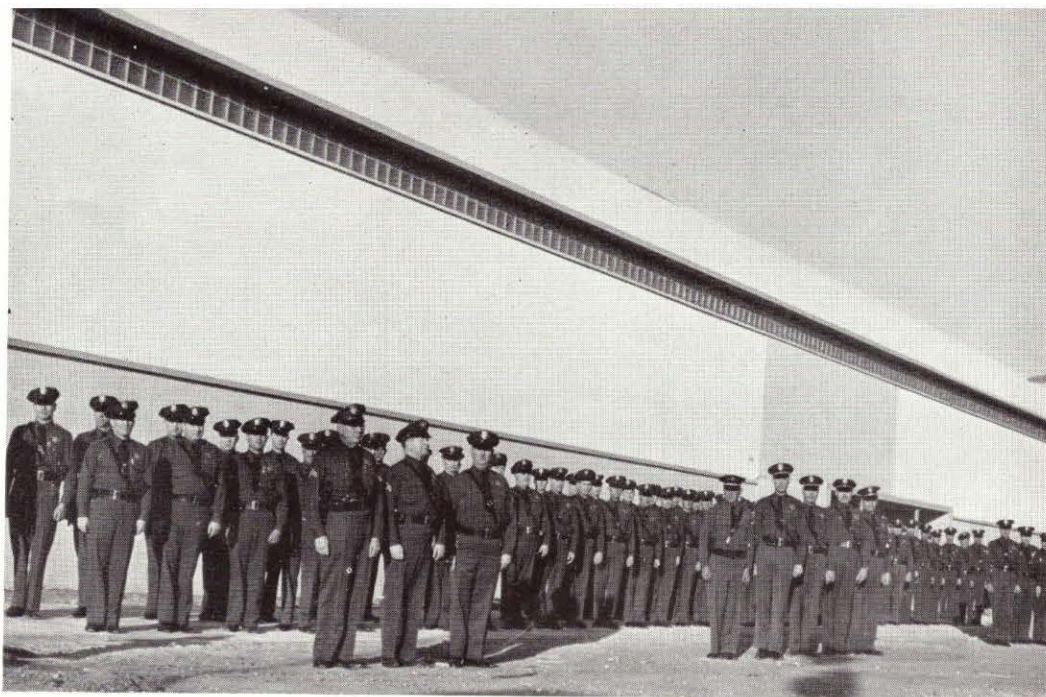




from experience in England, the safest place for an employee to be during an air raid is in the factory, lying prone on the floor behind some shielding object.

First warning of a blackout at Inglewood will be a 30-second series of staccato blasts on the factory whistle, to be followed by an announcement over the speaker system describing the kind of emergency in effect. Orders will be given to cut off electric power, extinguishing all factory lights, either immediately or within a minute or two. All machines are to be turned off at once.

Under the direction of foremen and personnel they have appointed for the purpose, all windows, louvers, and vents of any kind giving on the outside of the factory will be closed. The plant will be completely blacked out with the exception of the auxiliary blue lighting system, which will function until nor-



*Here, lined up in front of the new engineering building, are most of NAA's Inglewood police force. Others were on duty when the picture was taken.*



*North American Police Chief Frank Neuman and Capt. L. A. Scriven conduct inspection.*

mal illumination has been restored after all windows and other outside openings are closed. It is the responsibility of foremen to see that all blackout instructions are executed.

All plans have been made with the attitude that an air raid is something to be expected. Officials consequently urge employees to give careful thought to what they would do under those conditions, with a view to preventing panic or hysteria. With the safety of personnel a paramount consideration, they point out, everything possible is being done to forestall accidents or injuries due to bombing. Obeying orders and keeping cool will insure the greatest advantage from these arrangements.

Employees at all three plants are invited to forward to the plant protection office any suggestions which may occur to them as aids to emergency precautions. Such ideas are now eligible for cash awards under the plant suggestion program, and will be considered on the same basis as innovations in shop procedure.

One of the most important emergency rules is that no employee should attempt to leave either his department or the plant during a blackout without specific instructions. Only through observance of this regulation will it be possible to preserve order. All general directions will be broadcast over the speaker system. Another precautionary note: in these dangerous days, more than normal care should be taken that no lights are left burning when employees leave their automobiles in the parking lot.

At Inglewood, when main power switches have been thrown following the first signal of a blackout, personnel of the maintenance and police departments will rapidly inspect the entire plant to make certain that no windows remain open. Within five or ten minutes, the usual factory lights will be turned on at the order of the command office, and power will also be restored to machinery circuits.

Foremen have been instructed to remain near their telephones during a blackout to receive instructions which may be issued from the command office, the maintenance, police, or fire departments, or the night superintendent. The "all clear" signal will be a one-minute continuous blast on the factory whistle.

A few figures will help to illustrate what the impact of war has meant to the plant protection department at Ingle-



*Arthur M. Hast of the plant protection office uses one of the telephones in the command office, nerve center of the plant for protection purposes. The telephones, direct lines, lead to the plant police office, the maintenance department, the office of Capt. S. R. Barker, resident Air Corps representative, and to outside agencies with whom contact would be maintained during an emergency.*





*At left, a member of NAA's Dallas police force guards mail being taken to the post office. The husky gentlemen above are Golden Glove Champ Tony Novak, left, and Wrestler Lee Wykoff, Kansas plant policemen.*

wood. A year ago the factory had one full-time fireman. By last December, the organization had been expanded to include 60 volunteer zone captains in charge of 20 designated factory areas. Now there are 22 full-time firemen, men of long training and experience, backed by 120 zone captains and their alternates. In charge is Capt. C. L. Johnson, retired fire captain of the Los Angeles city fire department, whose specialty is rescue work. Formerly under the police department, the plant fire department is now an independent unit under general supervision of the plant protection office.

The police department has been increased from 87 to 130 men and officers, all on 24-hour call. Among its duties, of course, is a careful check of all persons at the plant gates to see that unauthorized persons do not gain entrance.

#### **Former F. B. I. Man**

A. R. Miller, who has been plant protection director for all three factories since last September, gained his background in law practice and as a member of the Federal Bureau of Investigation. He received his law degree from Wesleyan university, Bloomington, Ill., and is a member of the Illinois bar.

Reports of sabotage, theft, and other violations are continuously being investigated by the plant protection office, but almost invariably some accidental cause, rather than deliberate intent, is found to be the explanation.

Recently, however, an ingenious scheme was uncovered whereby considerable quantities of valuable metals were being illegally hauled away from the California plant as "scrap," with the result that the perpetrator and his accomplices now face trial in federal court on theft charges.

Among miscellaneous duties of plant protection is supervising the admission

of visitors to the factory. Since the declaration of war, ordinary sightseeing tours are no longer permitted. No alien may enter the plant under any circumstances without authorization from the War Department at Washington. Even then, foreigners must have special escorts, and reports of their visits must be filed with the Army.

Stringent regulations also govern the admission of citizens having business in the plant. Passes colored pink, blue, white, yellow, red and white, and blue and white, according to the specific areas in which the visitor is allowed, are issued by G. A. Lea, lobby receptionist, after they have been properly countersigned by company executives.

What has been said of the Inglewood plant applies also, at least in general

outline, to the Dallas and Kansas City plants. Blackout procedure is, of course, simpler at the two newer, windowless plants, but regulations concerning employee movements during blackouts are much the same as those at Inglewood.

R. E. Smith, plant protection manager at Dallas, is a graduate of the University of Minnesota and, prior to taking over his duties at the Texas plant, was for eight years a special agent of the Federal Bureau of Investigation.

At the Kansas City plant, protection is in charge of Richard P. Shanahan, also a former F. B. I. man. About five years ago he left the F. B. I. to enter the criminal division of the Department of Justice, where he was a trial lawyer. For a time, he also practiced law in Chicago.

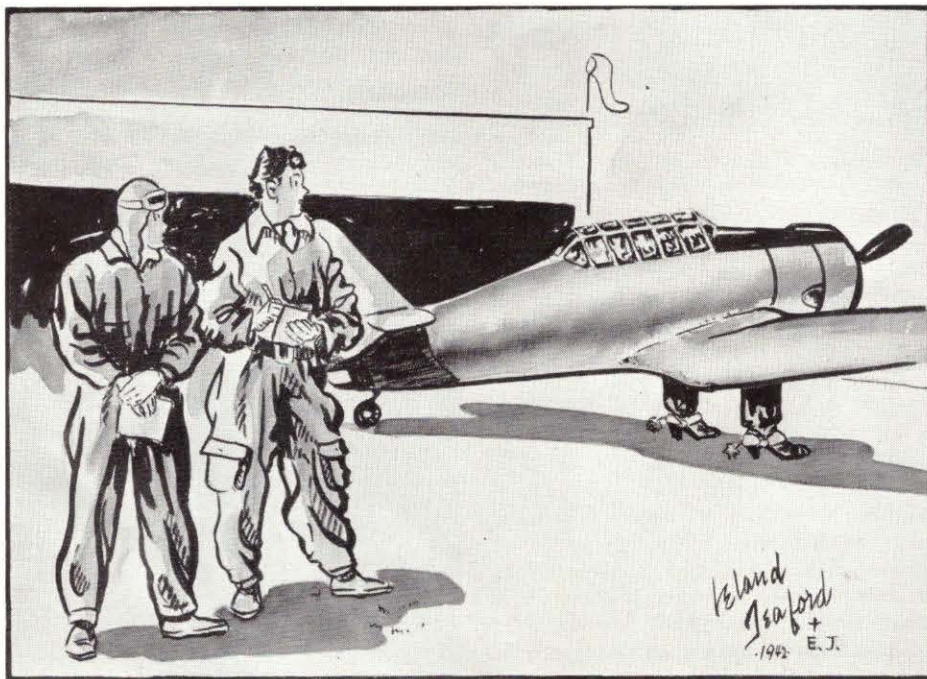


### **NAA Golfers at Inglewood Get Special Low Rates**

Golfers among North American's Inglewood employees will play at reduced rates this season by virtue of an agreement made recently with the Potrero Golf and Country club, Inglewood, by Kenneth L. Kellough, plant recreation director.

After 4:30 p.m. any weekday, NAA employees will be able to play until darkness sets in for only 35 cents.

Plans are also being made for organized intra-plant and outside competition and for group instruction at low rates by Ed Newkirk, of production control, who is a P. G. A. member and former golf coach at the University of Nebraska.

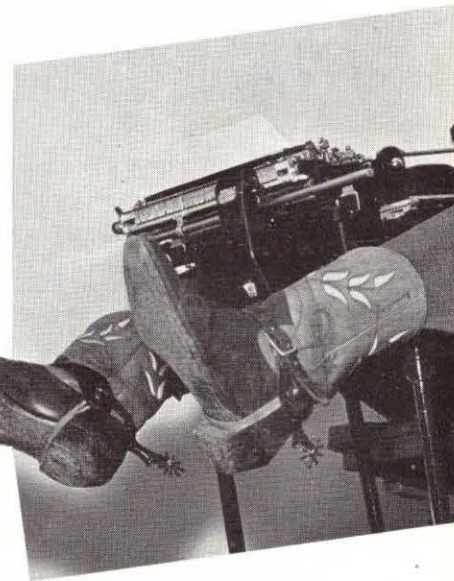


*"It came from North American's Texas plant."*





# Boots! Boots! Boots!



*The gentleman directly above, the Texas cowboy, really started something when he developed his characteristic high-heeled footwear. Cowboy boots are here to stay—witness these pictures from NAA's Dallas plant, where many office and shop workers alike still wear them.*

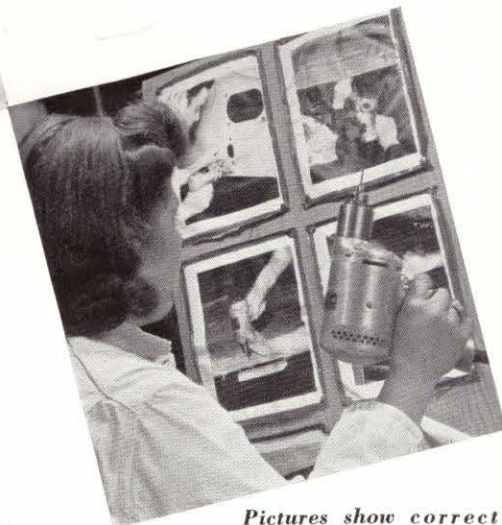




**North American Holds  
Classes for Beginners,  
Veterans, and Foremen**



*Above, Dallas National Defense school students learn operation of a milling machine from Instructor John Dobbs.*



*Pictures show correct use of the hand drill.*

## NAA's Education Departments Train Workers at Three Plants

**L**AST YEAR, when North American faced the problem of finding workers for its huge new bomber plant at Kansas City, scarcely a handful of trained men could be hired. Practically all experienced aircraft workers were already employed in established plants, and only a few score trained men, most of them drafted from the Inglewood plant, were available. These men were in supervisory positions of one sort or another.

This situation, which was duplicated to a lesser degree when the Dallas plant was opened and which occurs at any aircraft plant when the need for expansion arises, serves as a dramatic illustration of the need for educational programs at each of North American's three plants.

For this reason, there is an education department within the industrial relations setup at each plant, along with the personnel, safety, medical, and industrial relations research groups.

It is true that many of the men seeking employment as aircraft workers have had previous mechanical experience and that many of these are skilled automobile mechanics, machinists, welders, and like craftsmen. But the facts remain

that many are unskilled and that those with mechanical experience must learn the specific skills required to turn out and assemble parts for NAA bombers, pursuits, and trainers.

To meet the training problem, North American operates at each of its plants a four-fold educational program—preparatory training to insure a supply of acceptable workers, conducted in co-operation with the national defense and vocational training programs of local schools; inductance training, to properly orient new employees, conducted within the plant; trade extension or supplementary training to improve the skills of workers already employed, given in co-operation with educational agencies; and leadership training, conducted within the NAA organization.

To start at the beginning, an unskilled worker who wishes to become an employe of North American may enroll in a national defense training course at a high school, college, or trade school near one of the NAA plants. There he will no doubt be taught by a qualified employe of the company, who is either on leave or teaching part time. These pre-employment courses include such

subjects as sheet metal and riveting, machine shop, pattern making, and jig building.

For the Inglewood plant, most of the pre-employment courses are among those sponsored by the Los Angeles County Aircraft Advisory board. This board includes North American's educational director, John H. Fry, the educational directors of other major aircraft companies in the area, representatives of the state department of employment, county heads of the N. Y. A. and W. P. A., supervisory officials of the public school systems, and representatives of labor.

The Los Angeles City Aircraft school, a branch of the Frank Wiggins Trade school, is situated near the Los Angeles Municipal airport, on which the Inglewood plant is located. Ralph Hatton, its principal, is a North American employe on leave, as are the instructors of its machine shop production class. In the production class, selected new employes are taught specific machining operations, actually producing parts while they learn. Other classes, supplementary in nature, are taught by NAA employes on their off shifts.

For the Texas and Kansas plants,



pre-employment training is given in the existing school systems, with many of the instructors furnished by North American. The company has a hand in planning courses which apply specifically to jobs at North American.

After a new employe comes to work in the shop at Inglewood, Dallas, or Kansas City, he attends a series of six one-hour induction talks designed to help him become an efficient employe in the shortest possible time. Items covered include shop rules and regulations, accident prevention, first aid and industrial safety, good work habits, and principles of work simplification. In conducting these courses, the education departments use modern visual aids, including movies made at the Inglewood plant. The classes are held in the plant on company time and at company expense.

#### Supplementary Courses Given

The opportunity for the worker to obtain additional training does not end when he completes the induction course. On the contrary, one might say it has only begun. Thousands of North American employes are now increasing their present skills and learning new ones in supplementary training courses carried on in cooperation with the national defense and vocational training programs of the public schools. These men and women are preparing themselves for promotions and will be ready when the company, according to its policy of ad-

vancing those already employed instead of hiring new supervisory personnel from the outside, calls upon them to fill higher positions than those they now hold.

At the California plant, a large share of the supplementary classes are taught in the Inglewood school district, with North American employes teaching NAA-sponsored courses. These are arranged so that instructors and students alike go to school on their off shifts, enabling all to put in a full production day at the plant.

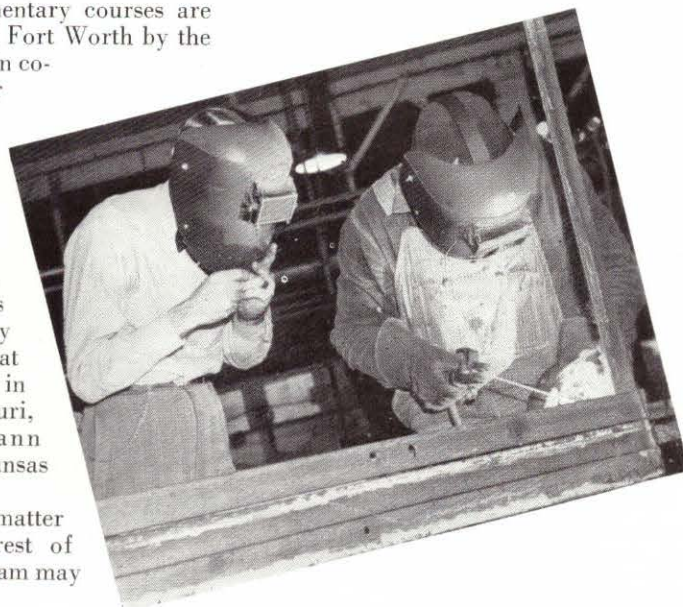
In Texas, supplementary courses are offered in Dallas and Fort Worth by the University of Texas, in cooperation with other colleges and schools, in Dallas alone by Southern Methodist university, and in Fort Worth by Texas Christian university.

For the Kansas plant, supplementary training is given at Manual high school in Kansas City, Missouri, and at Horace Mann junior college in Kansas City, Kansas.

Believing that no matter how thorough the rest of the educational program may

be, much specific instruction is still in the hands of foremen, supervisors, and leadmen, North American is presenting a course in "How to Instruct a Job," which was originally designed by the Office of Production Management, now the War Production board.

A small group of supervisory personnel meet informally with an instructor and discuss the basic steps that should be followed in teaching a new employe his job as easily and quickly as possible. This plan has been particularly useful



*Student M. Kelley, at right above, gets some tips on the art of welding from Instructor S. K. Buch. In the photograph at left, students at the Dallas National Defense school practice on drill presses.*



in Dallas and Kansas City, where many foremen and leadmen, as well as the other workers, were almost starting from scratch.

In addition to the "How to Instruct a Job" series, a comprehensive supervisory training course is given, which deals with foremanship, work simplification, company organization and procedures, and plant protection.

The four main subdivisions of the educational program — pre-employment, induction, supplemental, and leadership training—are its basic elements, but they by no means include all the

*(Turn to Page 30)*





*Alice Huffman checks a landing gear locking mechanism's inside dimensions while Simmie Parker points out engineering specifications on the blueprint. Jimmie Sturch, right foreground, inspects the threads on a trim tab control drum.*

## NAA Trainer Parts Inspected At Every Step in Manufacture

**A**T NORTH AMERICAN'S Dallas plant, "Inspection" is a very serious word to several hundred men or women, for they have the responsibility of inspecting every piece of wood, metal, fabric, leather, or plastic that comes into the plant to be used as an airplane part or to manufacture an airplane part. The hundreds of pieces that go through fabrication, installation, and operations of an AT-6A or SNJ-3 are minutely inspected for stress, strain, color, elasticity, tensile, and detail as specified on engineering drawings and specifications.

The inspectors are trained, technically

minded persons, one of whose main duties is to see that the NAA high standard of quality must be maintained. Adherence to that standard automatically takes care of the business world's adage that "the customer must be satisfied." The customer in this case is chiefly our own government, which is very particular about getting its orders filled correctly.

The persons who cast a critical eye on everything that goes into an airplane at the Dallas plant are headed by Ray Martin, chief inspector. As his assistant inspectors, he has Ed Mullaney for the

day shift and Pete Chevalier for the night crew. A score of foremen and supervisors coordinate the many phases of inspection work for these men—and it takes quite a bit of coordinating.

As an example, let us follow a plain 48 by 144 inch sheet of alclad thru the plant. That sheet of metal is delivered to the receiving department, and immediately an inspector checks the packing slip to see if the order has been correctly filled.

### First Cut to Shape

Our sheet of alclad may go to make any of half a hundred pieces, but let's say it's going to be made into wing ribs. If it is, it goes first to the material preparation department, where it is cut to approximate shape on a router jig. The template for that jig is made from an engineering drawing. The jig itself is under the constant scrutiny of an inspector.

Routed into the rough outlines of a wing rib, one piece of the original sheet now goes to the hydro press. There it slides onto a form block (carefully inspected beforehand) and is pressed into something more closely resembling a regulation rib.

Next it is heat-treated. This gives it the hardness necessary to stand the stress and strain to be thrown on it in flight. It is properly heated, quenched, and undergoes another inspection. After the inspector is satisfied that the rib can take it, it goes to another inspector to see if it is exactly the right size and shape. Some hand work comes next and then another inspection.

### Stamp for Each Test

Each time the rib goes through an examination, it gets an O. K. stamp from the inspector before it travels on.

Now it is ready for a little color. Into the dip tank it slides on a moving chain—out again with that yellowish-green appearance that zinc primer-coating gives. (That yellow-green paint has also been given a specific gravity test by an inspector.) Dry in a short time, the rib makes a brief visit to the storeroom until it is called into actual service.

Back into circulation again, the rib goes to the detail assembly jig to have

*(Turn to Page 29)*

*A neatly uniformed woman inspector, left, checks hydraulic parts. At the right, Inspector E. L. Johnson calipers the inside of an instrument panel opening. Measurements must be exact to allow for perfect fitting of instruments.*





# Travelunches, Chuck Wagons Feed NAA Workers

## Portable Lunch Counters Bring Hot Meals into Shops At Inglewood, Dallas Plants

**S**HORTLY before each lunch period at the Inglewood plant, 30 gleaming white carts emerge from the commissary and hurry on carefully planned routes to as many locations throughout the plant.

These are the Travelunches, mobile food counters of North American's unique cafeteria service. In Dallas, where a dozen similar units are in service, they are quite appropriately known as chuck wagons. Each of the Inglewood Travelunches carries enough food, including hot dishes, to feed more than 400 persons.

The mobile units dispense a great deal of food each day, and do it fast. On a typical day recently, the Inglewood units served 2,200 pounds of sirloin of beef in sandwiches, 1,500 pounds of spaghetti, 6,000 individual apple pies, 450 dozen ice cream cones and bars, 150 pounds of coffee, 4,000 half pints of milk, and several hundred doughnuts and rolls.

The food is prepared in the new commissary building, completed in mid-November, 1941. The building contains, in addition to kitchen facilities, three walk-in refrigerators, a storage pantry, the manager's office, and locker rooms and showers for the 80 employees.

### Chuck Wagons in Texas

In Texas, dining facilities include a conventional cafeteria for the office employees and a centrally located steam table installation in the shop, plus the dozen chuck wagons.

A staff of ten cooks presiding over a like number of big ranges in one of the best-equipped kitchens in the Southwest provide the food for all three. The big kitchen contains gadgets which would put Alladin's hard-working genie to shame. There is, for instance, a contrivance which burnishes silver. The kitchen attendants simply drop the silver into the machine, turn it on for a few moments, and take the silver out, as bright and shining as a new dollar.

Then there is the mechanical potato peeler which disrobes a bushel of potatoes in practically no time. And if you can't pay the check, there is no getting off by washing dishes, because the electric dishwasher would have the job done almost before you got through rolling up your sleeves.

The Inglewood Travelunches are rub-



*J. R. Moore, Dallas cafeteria manager, supervises the preparation of food by a part of the staff of ten cooks employed in the big, well-equipped kitchen of the Texas plant.*

ber-tired trucks, table high, with provisions for keeping hot dishes at the proper temperature and with stainless steel insulated coffee urns which will keep the beverage hot for hours. Heated fire bricks are used to keep food hot because safety regulations prevent the use of any actual flame within the plant. The Texas chuck wagons are electrically heated.

The name "Travelunch" was coined by George Hurter of sheet metal, who won a month's free lunches in a contest sponsored by SKYWRITER, plant newspaper.

The plan of feeding the thousands of North Americans at Inglewood by means of portable lunch counters was conceived last summer and announced by the company on August 20. On December 8, in

keeping with the North American tradition for getting things done in a hurry, the Travelunches, designed and built in the plant, were in service. Before service was begun, trial runs had been made to determine the most convenient stations and the fastest routes to them.

The staff works rapidly. For the noon lunch period, for example, the commissary employees come to work at 9 a.m. and prepare the needed thousands of sandwiches before they go out into the plant at 11. The Travelunches make five runs during the day. The three busiest periods are at 11 a.m., 8 p.m., and 10 p.m., but a few wagons go out at 3:30 and 6 a.m. in order that there might be service during all lunch periods.

*Several of the Inglewood fleet of Travelunches, each manned by two uniformed attendants, leave the commissary building before the noon lunch period at the California plant. Similar portable lunch counters at the Texas plant, called chuck wagons, are used to supplement regular cafeteria service.*





# Through the Can



## A War Bird Spreads Its Wings

Above—Its two powerful engines pulling it swiftly skyward, a Kansas City-built B-25 Mitchell bomber retracts its wheels after its initial takeoff from Fairfax airport. This hard-hitting North American medium bomber is but one of many which are going into the fight against the Axis. Although its actual speed, as well as range and bomb load, is secret, the B-25 has been described by U. S. Air Force officials as "faster than most foreign pursuit planes."

## Photographer Photographed

Below—Photographer Paul Dorsey himself became the subject of SKYLINE Photographer Sherwood Mark when the Look cameraman visited the Inglewood plant recently. Here Dorsey climbs a stepladder to get a better camera angle on the soldiers and North American girls grouped around the jeep. A B-25 bomber provides the background. The picture was one of a sequence which the magazine photographer took on women at NAA.



## Impressed

Right — Senator Claude Pepper of Florida, a recent visitor to the Inglewood plant, hoists the Allison engine of a Mustang fighter while Charles Cox looks on. Said Senator Pepper after he and his party had been shown through the plant by President J. H. Kindelberger: "I am enormously impressed with the efficiency, the layout of this enormous plant, the spirit of cooperation among the men, and the high degree of morale apparent even to the casual visitor."





# era Doors

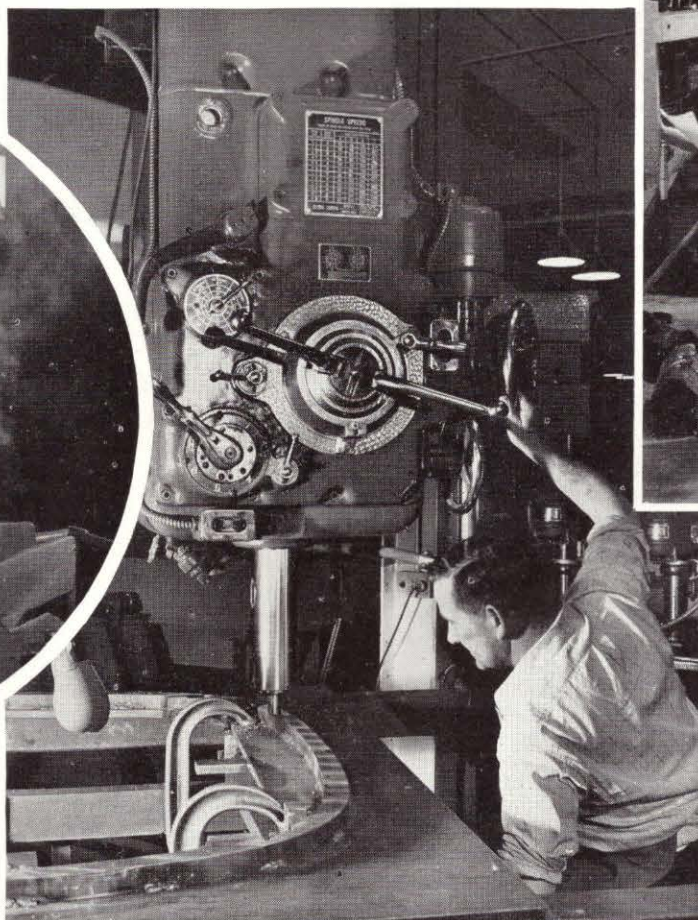


## Bombers for the United Nations

Left—The several insignia on these B-25 Mitchell bombers awaiting delivery on the Inglewood flight ramp are striking evidence that the Axis invaders will be met on all fronts. These planes (starting nearest the camera) are for the United States, Russia, the Netherlands East Indies, Great Britain, and, again, the United States. The B-25, North American's high-performance medium bomber, long produced in quantity at Inglewood, is now also in production at NAA's Kansas plant. It was a B-25 which last month became the first U. S. Army plane to sink an Axis submarine in the Atlantic.

## Bubble! Bubble!

In the circle—This is not a re-enactment of the witches' scene from Shakespeare's Macbeth. Rather it is Lee Pina fluxing the Kirksite furnace in the die casting department of the Inglewood plant. Kirksite, an alloy which combines a low melting point with greater hardness than that of lead, is used in making dies for stamping aluminum and duralumin.



## It Can Do Anything

Above—George "Scotty" Leitsch, Inglewood jig department, operates a Carlton radial drill press, on which the drill can be moved anywhere inside a 16-foot circle and up and down, and on which the material can be tilted at an angle. It can "do almost anything."

## Inside a Bomber

Right—The fuselage of a B-25 bomber frames a North American inspector as he checks its construction at the Inglewood plant. Every piece of material and every purchased part is inspected at every step in the manufacture of a Mitchell, Mustang, or Harvard.



## Avion

Above—Homes in Avion Village, first of two 300-unit housing colonies for defense workers, built by the federal government near NAA's Dallas plant. Avion has been occupied for several months. The other project, Dallas Park, is more recent.



## Morale

Left—The slogan which hangs over the row of B-25 fuselage sections which an Inglewood employee is inspecting in this picture is but one of many which have appeared spontaneously in North American plants since December 7.







Patricia Blakeley demonstrates steps in North American's hiring procedure. Above, she holds the notice from the Central Aircraft Employment office which admits her to the employment office at the plant. NAA Policeman F. O. Morisette and Private Roy Rudder, U. S. Army, stand guard at the gate.



Interviewer John Stewart, above, confers with Miss Blakeley. Interviewing is done in Los Angeles and at the plant after the medical examination, which is being conducted below by Dr. C. L. Lloyd, plant physician.

## New Hiring Procedure Will Ease Task of Employment Department

**T**ODAY, because of constantly increasing production and because a constant stream of replacements is necessary to fill the positions held by men going into the armed forces, America's aircraft plants need a continual supply of new workers.

Yet at the same time many of the men who would normally furnish that supply also are volunteering or being called to service in our armed forces, and many others are finding employment in defense work outside the aircraft industry.

Aircraft employment departments, including North American's, are meeting this problem in two ways. The first is an extensive program of hiring women shop workers. This has proved helpful, but is not in itself a solution because there are many aircraft jobs which are not suitable for women and because the supply of women workers in any one area is also limited.

### Central Hiring Office

For this reason, North American and other aircraft plants in the Los Angeles area have established a central aircraft employment office in cooperation with the United States Employment Service. With all hiring handled through the central office in conjunction with the federal agency, a shortage of aircraft workers

in the Los Angeles area can be met by bringing in workers from other sections of the country. Already many automobile workers, coming to the West Coast on their own initiative, have found places in the aircraft industry. When they are needed, others, who have registered with the U. S. Employment Service in eastern states, will be advised to come to Los Angeles.

### Common Application Form

Under the new centralized employment procedure, a prospective North American employee registers at the central employment office, recently established at Twenty-first and Figueroa in Los Angeles. When he does so, he fills out a common application form which will henceforth be used by all the major aircraft firms in the area.

If North American has openings available, and if the applicant seems qualified to fill any of them, he will discuss job prospects and his abilities with one of several North American representatives who are stationed at the central office. All future applicants for jobs at North American will go through this initial interview in Los Angeles.

If the interviewer finds that the applicant fulfills the general specifications of North American, and if there is a place available at Inglewood, he is told to



report to the new employment office at the plant.

There the first step is a complete medical examination, to insure that the applicant, if hired, will not lose time from work due to physical reasons which could have been detected at the time of hiring and also to ascertain definitely whether or not he is physically equipped to do work assigned to him. This examination is now conducted in part at the plant and in part at the office of an Inglewood physician. Soon, with more complete equipment in the new employment building, the entire examination will be given by Dr. C. L. Lloyd, plant physician, and his staff.

### No Age Limit

This medical examination, incidentally, works to the advantage of older men and women, for North American's



employment policy is such that men or women of any age group will be hired if they are physically fit. The examination makes an age limit for NAA employees unnecessary.

If the prospective employee passes the doctor's examination, he goes next into the final interview, in which the actual hiring is done after the conditions and terms of employment have been discussed. Such matters as the nature of the work and the amount of compensation are settled here, and if the prospective worker finds them satisfactory, he is ready to continue.

#### Must Prove Citizenship

A session with one of the sign-up girls comes next. She checks his application form and records his proof of citizenship, his social security number, and any other forms of identification which may be required by government regulations for defense workers.

Here the new employee also signs his

identification card, employment agreement, and either a group insurance authorization or a waiver of group insurance. He gets his work notice, telling him when and where to report on his first day, and copies of the NAA employee handbook and the agreement between the company and the aircraft branch of the United Automobile Workers.

#### Fingerprinting Next

The matter of identification comes next. First the new employee is fingerprinted, then photographed. His right thumb print and his photograph will appear on his identification card, which he will be required to show whenever he enters the plant. A complete set of fingerprints is sent to the Federal Bureau of Investigation in Washington in order to determine that he has no police record of any sort. This last precaution is as much for the protection of other employees as for the protection of the company.

The photograph taken, the new employee is ready to come to work at the time specified on his work notice. At that time he reports to the employment office before his shift begins. There he is issued a badge and a temporary identification card which will be used until he is issued a permanent one. The permanent card, which bears his photograph, thumbprint, signature, and physical description, is completely encased in a sealed plastic case, so that the employee is protected against anyone's tampering with it.

#### Some Hired From File

This description of North American's hiring procedure has assumed that the new employee went straight through the routine at one time. This is not always the case, and frequently, when an em-

ployee requisition comes in from a foreman or supervisor telling of a vacancy in the plant, the employment department finds a man by consulting its files or those of the U. S. Employment Service.

In this event, of course, the applicant will already have been passed by the preliminary interviewer at the Los Angeles central employment office, and he will proceed immediately to the medical examination at the plant.

These are the usual hiring procedures, and there are few exceptions. Any person seeking employment with North American should make it a point to register at the central aircraft employment office in Los Angeles.

#### Part of Industrial Relations

North American's employment department, directed by J. E. Jones, is a part of the company's larger, integrated industrial relations setup. It, together with the personnel records and labor relations groups, is under NAA's personnel director, E. D. Starkweather. The three personnel groups, in turn, are parts of the industrial relations department, which also includes education, medical, safety, and research groups. The entire industrial relations departments at the Dallas and Kansas City plants also are responsible to the industrial relations director at Inglewood, M. E. Beaman.

#### Department Has Grown

With the rapid personnel expansion necessitated by the increased production needs of first the Allied powers and then the United States itself, the employment department has experienced a logical parallel growth, until today employment personnel is more than double that of a year ago, and the department is housed in a new and larger building completed late in February.



*Above, Conway Thompson takes Miss Blakeley's fingerprints. Her right thumb print will appear on her identification card, and a complete set is sent to the Federal Bureau of Investigation in Washington to be checked.*

*At left below, Connie Hanson checks with Miss Blakeley on the several forms she has filled out and records such things as proof of citizenship. At right, Ralph Nielson prepares to take the photograph which will appear on her identification card.*





# Inglewood Maintenance Shop Is Complete Plant Within the Plant

**"OUR JOB** is to get the plant running and keep it running." In these words Lloyd E. Johnson, general foreman of the Inglewood maintenance department, describes the work of his men.

The maintenance department, virtually a complete plant within the plant, is versatile, including as it does a sheet metal shop, a welding shop, a paint shop, an electrical shop, a plumbing shop, a general repair shop, and even a blacksmith shop. Janitors, formerly in maintenance, now have their own department, but remain under Johnson's supervision.

It is the maintenance department that gets the call whenever anything goes wrong in the plant. A dispatcher takes the call and passes the word along to the proper craftsman. If it is an emergency, a trouble-shooter takes off on a bicycle. The introduction of the bicycles has cut traveling time to far corners of the plant to less than a third of the time it used to take on foot, Johnson says.

## Work Is Continuous

If the job at hand is a major one, lasting longer than one shift, the next shift takes over and continues the work. A coordinating sheet filled out by the first repairman tells the second man the exact status of the work and what remains to be done. There is no work stoppage until the machine is running again.

The classification of employees within

the department gives some clue to the versatility of maintenance. There are plumbers, electricians, janitors, mechanics, painters, pipe fitters, oilers, sheet metal workers, draftsmen, clerks, laborers, and welders. In each of the trades there are both maintenance and construction men.

These men, their foreman says, do virtually everything except actually build airplanes. The name of the department is descriptive of only a part of their duties, those of maintaining the plant in operating condition. They also help to put the plant in operating condition



*Kenneth Boyer, above, takes off for an emergency repair job. Introduction of bicycles has cut traveling time to far corners of the plant by two thirds.*

*In the photograph at the left, Alex Seebach and Charles Yawman prepare the double row of drill presses for installation in the Inglewood machine shop.*

by building air ducts, bins, stands, scaffolds, and any other special equipment which can be constructed in the department.

No repair job in the plant is too large or too small for maintenance to handle. The department's craftsmen have repaired everything from huge machinery parts weighing tons down to delicate typewriter parts whose weight is measured in ounces.

Servicing and repair of the little tractors which haul parts and stock through-



*The men on the scaffold, Ted Johnson, left, and Duain Goodman, are installing the monorail on which a conveyor will ride. Installation, as well as repair and servicing of machinery, is the responsibility of maintenance.*

out the plant is another duty of the department. Each afternoon at the end of the day shift, the little machines flock to their base in the centrally-located maintenance quarters for gasoline and oil, and, their thirsts quenched, scurry back to their posts.

Compressed air for the entire plant and power for such equipment as requires direct current is also furnished by the department, which houses an air compressor and a D. C. generator.

## Janitors Handle Salvage

The janitors, now in their own department under Harvey Wallace with Johnson as supervisor, perform the work of salvaging usable waste stock in addition to usual janitorial tasks. For this purpose they use a new conveyor sorting and loading device. Contents of their refuse trucks are dumped onto a moving belt which runs past bins into which usable pieces of metal are placed. The unusable refuse drops from the end of the conveyor belt into trucks and is hauled away.

Johnson is a North American veteran who started work at Inglewood on October 28, 1935, when the original plant was in the early stages of construction. An experienced electrician, his first job with NAA was that of construction electrician. Shortly, he was made electrical foreman. Later, machine maintenance was also put under his supervision, and since June, 1941, he has been general foreman of the maintenance department.

NORTH AMERICAN



SKYLINE





AT THE august age of 12, Sam Kovsky, Texas son of Polish-born parents, tinkered with the motor of a stalled car, tinkered with it in a haphazard sort of way until suddenly, without knowing exactly how he accomplished the miracle, he had it running again. From that day on Sam Kovsky has possessed one all-consuming interest—machinery.

In Sam's case, that fascination which machinery has for some temperaments has landed him in the machine shop of North American's Dallas plant as a skillful turret lathe operator. Born in Dallas, he had never seen an airplane factory, nor had he ever worked in a machine shop before he was employed at North American on April 7, 1941.

"He's a top hand," his foreman says, and down in Texas, where, in the old days, to be a top hand was an accomplishment of magnitude, that is a compliment not to be taken lightly.

Sam was born in Dallas. He is 25 years of age, is married, and has a three-year-old daughter. Like many second-generation Americans he is as much a native of this particular part of the nation, in drawling, unhurried speech, in thought, and in habit, as the descendants of the Texans who were with Travis in the Alamo and with Houston at San Jacinto.

After he suddenly discovered the fascinating new world of machinery, Sam soon built his own shop. There, old motors of all kinds became his prey, subjects for minute vivisection and rejuvenation. Shortly after entering Technical high school in Dallas he overheard his principal remark that a garage was going to charge him \$80 for repairing his automobile.

"Let me do it for you," the boy offered. And he did it, with expenditure of 80 cents.

So impressed was the principal with the youngster's mechanical ability, that he allowed him thereafter to choose his own method of education. With great glee at escaping history, foreign languages, and other such subjects, which to him were "the bunk," Sam applied himself solely to the study of English, mathematics, and machine shop work. There he gained the groundwork for lathe operation and other knowledge which is standing him in good stead now.

Sam Kovsky has been lucky in the people who guided him. The

(Turn to Page 30)



Sam Kovsky: "I had my eye on this machine."

## SKYLINE——SILHOUETTES

WHEN THE first Kansas City-assembled B-25 Mitchell bomber took off from an icy Fairfax field runway, seated in the co-pilot's seat beside Pilot Paul Balfour was Jim Bradley, general foreman of the flight test and service department. The tall, dark-haired foreman kept constant watch on the many engine instruments and gadgets which indicated that all was well with the bomber's first flight.

Jim had come to Kansas City from the Inglewood plant several months before this first flight. Prior to joining North American in 1941, he had been to many places to hold a wide variety of jobs and gather

a wealth of experience in the field of aviation.

He grew up and was educated in the town of his birth, Mattoon, Illinois, but as a young man he decided that the quiet life of a small Midwestern town was not for him. So he joined the Army Air Corps as a mechanic. If it was travel Jim was looking for, he immediately got it, for he was attached at once to the 3rd pursuit squadron at Clark field in the Philippine islands. He stayed there three years, being discharged at the end of that period as a private, specialist first class.

The historic year of 1929 found Jim putting tri-motored transports together in the final assembly department of the Ford Motor company's airplane division at Dearborn, Michigan. He stayed two years, and was a member of the flight service department at the time he left.

Jim nearly lost his life one day during the next two years, when he was working for the Towel Aircraft company, makers of twin-engined amphibians. He was flying with Lieutenant George R. Pond, who was testing an amphibian. Rather, he was flying until the plane lost its tail on the takeoff, plunged into Lake St. Clair, and sank immediately. Jim was knocked out and would have met a watery death had not Lieutenant Pond pulled him out—for which heroic feat the officer received a congressional medal.

From 1933 to 1935, Jim's name was on the payroll of the Lambert Aircraft company at St. Louis, where he was in the maintenance and airplane and engine overhaul departments. In 1935, he returned to Detroit to work in the maintenance and service departments of Central airlines.

Soon the urge to travel sent him, with his wife and little son, to the West Coast and a job at Douglas's El Segundo plant. There Jim first

(Turn to Page 30)



Jim Bradley sees that the B-25's are ready to fly.





*The drill presses in this photograph of the Dallas machine shop make it a veritable forest of machines.*

## Machine Shop Typifies Dallas' Spirit of Getting 'Em Built Fast

**I**F THERE is one thing more than any other that has characterized supervisory personnel and workmen alike in the Dallas plant, it is complete and unmitigated disdain for all the production prognostications made by the experts.

Government regulations rule that the accomplishments of Dallas North Americans, 90 per cent of whom a year ago didn't know the difference between an airplane elevator and a freight elevator, must remain a military secret. But if those accomplishments, spoken in terms of actual production as compared with forecast production, could be disclosed, the results would gratify a public which is vitally interested in the actual progress of the defense effort.

Every part of the plant has contributed equally, but the machine shop will serve excellently as an example of what has gone into the records on the credit side for the big Texas airplane factory.

When plans for the machine shop were

laid out and completed, the experts began to estimate the possible output. Into their calculations went the skill training factor which held, for example, that it takes two to four years to turn out a good turret lathe operator. Then they took into consideration a second factor—that they were going into an area which was still predominantly agricultural, even though the industrial baby was impatient with his rattle and growing strong enough to climb over the barrier around his cradle. From past experience with manufacturing units, they took their other factors, added the whole thing up, tried to be as optimistic as possible, and drew up a schedule.

This schedule said that there should be a certain amount of scrap resulting before actual production could begin, so much resulting for the first three months after production began, a diminished but still sizable amount the second three months, another diminished amount the third three months, and so on.

At the end of the first three months, that schedule, so logically arrived at, was an anachronism, as out of date as the Versailles treaty. The machines

were already on production, and the amount of scrap was amazingly low. The schedule was discarded completely. Less than eight months after the first three airplanes were delivered to the Air Corps from the Dallas plant, the scrap, or waste, had been cut below that of airplane factories which had been operating for years.

Other estimates affecting production from the machine shop met the same fate. Men and machines there went blithely along pouring out an unforeseen flood of detailed parts for the trim, speedy advanced army and navy training planes.

The story of production there has been a story taking into account two major factors—machines and men.

As for the first, North American equipped its Dallas plant with the most modern, most efficient machinery that money could buy. As for the second, they came from farms, from ranches, from garages, from railroad machine shops, from circuses, from college campuses, from national defense training schools to man the machines and make them produce.

### Out of Saddles

Almost literally in some instances, they dropped out of the saddles of ranch ponies at the end of a hard day's work, pulled the riding gear off their mounts, packed their clothes and headed for the Dallas plant. More than one erstwhile "ranch hand" is now riding herd on an intricate machine in the Dallas NAA machine shop.

The machine shop covers a sizable area of the plant. At first glance, that area appears to be a veritable forest of machines, of all sizes and shapes. Through it run the aisles and passageways symmetrically laid out, like so many planned paths through a forest.

Unlike most airplane factory machine shops, the Dallas shop is almost completely self-sufficient to produce the 800 detailed metal parts needed in building an AT-6A or SNJ-3. (The term "detailed parts" is used to distinguish the work turned out by the machine shop from those parts made by sheet metal, fuselage and other departments of the factory.) In those parts of the nation where industrialism is further advanced, factories often obtain certain parts from established machine shops specializing in them. Here, however, it was necessary to plan to make practically all detailed parts in the plant itself.





Consequently, that big forest of machines contains the mechanical instruments for tooling any part needed. When it is remembered that some parts require as many as a dozen different operations, this gives some idea of the completeness of the equipment. Here are machines even for making the gauges used to test the parts which workmen on other machines are turning out.

The turret lathes, engine lathes, milling machines, boring machines, drills, and many others, are miracles of perfection. In many instances, they must perform identical operations on one part after another, with a permissible margin for error of only five ten-thousandths of an inch. This is one-half the thickness of a single human hair.

#### Machines Nearly Human

To those seeing the machine shop for the first time, perhaps the most fascinating mechanisms are the automatic machines, all powered by electricity, which turn out small parts. To say they are almost human would not quite be an ample description. For whereas the ever present probability of error exists with human beings, it is almost eliminated in these mechanical marvels. The operator simply puts a supply of barstock into the machine, and looks on as it is converted into numerous small parts.

One of the machines makes flap control rollers, which look very much like spools on which sewing thread is wound. First this machine moves the barstock



forward exactly the proper length for the roller. A split second later one tool moves in from the side to rout out the side of the metal to give it the spool shape, and at the same time a bit moves in from the front to bore a hole through the center. When the hole is finished, the bit automatically moves back and a reamer slides in to put the finishing touches on the hole. The moment it finishes its job, it slides back, and a cutting tool comes forward from the side to slice through the metal roller. Even as the finished roller drops into a container, the machine has again moved the barstock forward into the routing, boring and reaming mechanism to repeat the operation on the next roller. And all of this without being touched by human hands.

Not snow, but shavings from his production milling machine, frame Earl Bates in the unusual picture at the right. The turret lathe operator at the left is Laddie Birge, grid star at Oklahoma university in 1939 and 1940.

Efficient though these devices are, back of them in the successful production effort must always be the men.

"How do you account for the fact that you have been able consistently to reach production goals long before it was originally believed possible for you to do so?" Latham Pollock, youthful superintendent, was asked.

#### Answer Lies in Men

"I think," he answered without hesitation, "the answer to that question is the men in the machine shop, both the supervisory personnel and the machine operators. They are the most conscientious workmen I have ever seen. From the start they are doing the best they can, first to learn their job and then to fill it."

He estimated that at least 50 per cent of the men had never had any experience in mechanical work before becoming connected with North American.

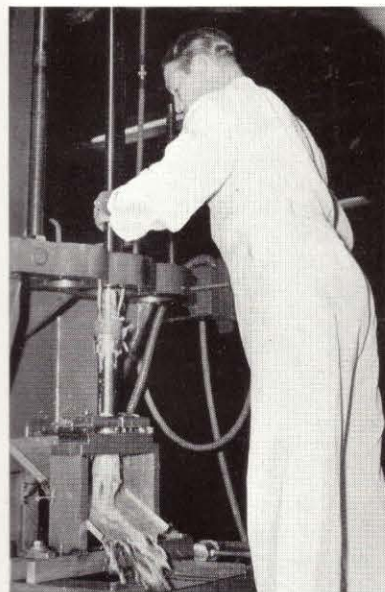
"We used to think two to four years experience was necessary to produce a turret lathe operator. Well, we've got men in the shop who are doing excellent work after only three months on a machine. Of course they are not as versatile or well-rounded in ability as a man with, say four years of experience, would be, but for the particular job they are doing, you can't beat them."

To call their backgrounds varied is to put it mildly.

On one machine is an ex- rodeo performer. At another nearby is a husky 200-pound youth, who last fall and the

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The honing machine that Henry Rose is operating at the left below looks like a miniature replica of the oil rigs on which he worked before coming to NAA. At the right, H. W. Lomas, who for two years operated the air-conditioning unit for the cage of Gargantua, famous circus gorilla, rolls a truckload of landing gear knuckles up to the power milling machine operated by Ervin Brannon.





# Young Britons Learning to Fly AT-6A's in Texas

## Lads from England Train on Newly-Established Field Where Cotton Once Grew

ON THE outskirts of the peaceful little town of Terrell, Texas, the noon sun shone lazily down. Along a dusty road a creaking buckboard rolled slowly along, pulled by two shuffling, weather-beaten mules. The three negro occupants of the buckboard sprawled comfortably on sacks of beans and corn meal in the wagon bed.

Suddenly this peaceful pastoral was interrupted by an ear-shattering roar from across the high barbed wire fence which paralleled the road. The trio in the wagon grabbed their hats and ducked their heads. Even the mules came out of their lethargy and turned their heads away from the sound. They knew what was coming next. A hurricane of rich, black Texas dirt hit them.

The cause of the disturbance was one of a score of North American AT-6A's. The same thing happens many times a day around Terrell, not far from Dallas, for that is where scores of lads from the British Isles are training to be fighter pilots. The Terrell Aviation school, branch of the Dallas Aviation school, has contracted with the British government to take young men fresh from England, Wales, and Scotland and give them training for service in the near future with the Royal Air Force. The advanced trainers, North American AT-6A's, in which they get their training, were all manufactured at the Dallas plant.

That phrase "service in the near future" is the motivating force behind all that these young Britishers do. Set on becoming combat pilots in the shortest



*"Now this river curves south about 10 miles west of Dallas." A Terrell instructor has a final word with cadets before the takeoff.*

possible time, they live life to the *n*th degree and fly the same way.

When the advanced group get at the controls of combat trainers, and some of them are there after less than two hours of basic flight instruction, they give the ships almost as much of a workout as any NAA test pilot ever did. Immelmanns, long series of slow rolls, tight figure eights, chandelles, and in fact, everything in the book—these are their meat.

And they like the airplane. One fair-haired, blue-eyed lad was asked what he thought, off the record, of the per-

formance of the AT-6A. His reply was, "They are just about perfect for the type of training we need before stepping into Spitfires over there. They are easily controlled, have a great deal of power and almost fly themselves at times. And they are quite good instrument ships. You know we'll be doing a bit of instrument flying at night over the channel and about."

His commander, Squadron Leader A. Beveridge, dryly remarked that his information was exactly what SKYLINE would like best, but the cadet insisted that he had no criticism of the ship.

### His Hands Full

Squadron Leader Beveridge has his hands full serving as assistant commandant of the hundreds of cadets in training at the Terrell school. Commandant is Wing Commander F. W. Hilton, who divides his time between the Texas school and one at Ponca City, Oklahoma. Both men are determined to make good pilots of their young countrymen, and to do it in the shortest possible time.

The Terrell school was the first of six similar schools established in this country by the British Royal Air Force. It was started in Dallas last June and in August moved to a roomier site. At Terrell, landing fields were made where

*Flight Lieutenant Fred F. Willmot, left, R. C. A. F. representative at the Dallas plant, stands with Squadron Leader A. Beveridge. At the right, R. A. F. cadets in their pine-paneled classroom listen to their instructor through earphones. Soon they will hear commands from an air base control tower.*





for generations white fields of cotton had waved. Long, white barracks, pine-paneled classrooms, and huge metal hangars replaced the shacks of dusky cotton pickers.

Management of the school itself and of its instructors and ground crew, numbered in hundreds, is the responsibility of L. H. Luckey, a veteran flyer and co-worker of Major Bill Long. Major Long, well-known in Texas aviation circles, is owner-director of the Dallas Aviation school and its several branches. Luckey was born on November 11, but he admits it was several years before the signing of the Armistice made that date historic. He has been flying since 1919, has never had a bad crackup, and modestly attributes his record only to his name.

Luckey's chief flight instructor is Van Lloyd. Van and his assistants put the young Britishers through all the things it takes to make good pilots. From the first fundamentals of flight through instrument instruction in Link trainers to 300-mile cross-country trips at night, the youngsters are taught to take care of themselves and their airplanes "upstairs."

#### Entire Isle Represented

The English lads are an interesting group. Each district of the tight little island and its sovereign dominions is well represented among them.

For instance, there's a young corporal who transferred into the Royal Air Force from the Army. He was born in Southampton and educated at Bitterne Park Boys' school—a district which has withstood some of the worst bombardment of the war. When only 17, he enlisted in the county regiment of the Territorial



*These two R. A. F. cadets give an Americanized version of their "thumbs up" salute before taking off in a North American AT-6A combat trainer at Terrell field.*

Army and was soon afterward transferred to a home defense unit of the Royal Engineers. In December, 1939, he was transferred to the Royal Artillery where he became a crack bombardier. In June last year, this "veteran" soldier who was then just 18 years old, applied for training with the Royal Air Force and was sent to this country. After initial training on the East Coast, he was sent to the Terrell air school to finish his flying education.

Another of the embryo pilots is an ex-bobby. Thick-set and muscular, with the traditional English fair hair and blue eyes, this husky youngster would make a movie talent scout reach for his fountain pen and contract. When he was 19, this young man was on duty with the London metropolitan police during England's early "blitzes." He was accepted by the Royal Air Force

last summer and finished his elementary flying courses in the Midlands before being sent over here.

#### Hobby Is Painting

A serious lad of just 19, a painter by avocation, revealed that he had already found time to live in India, Italy, France, Austria, Norway, and, of course, his native England. If the gods of war had left him alone, he would have made a life-long study of research physics. He has been in the Royal Air Force about a year, and completed a special course with the Cambridge University Air Squadron before coming to Texas.

But no matter where they are from, these lads have but one purpose. They don't talk much about it, but many of them have brothers or classmates who have failed to return from excursions into Germany or over the channel. They may indulge in the horseplay of college-age youth everywhere, but underneath it all these lads are men engaged in the serious business of becoming fighter pilots.

*These North American combat trainers with their U. S. Army Air Corps tail insignia provide a striking example of Anglo-American solidarity, for the pilots are British Royal Air Force cadets at Terrell, Texas.*







*This is the once peaceful waterfront at Palembang, Sumatra, where Mr. and Mrs. Sauve lived until the war recalled him to service.*

## Sumatra Home Captured, She Fights in NAA Shop

SOMEWHERE in the South Pacific, a captain in the United States Army is leading his men into battle against the Japs. Thousands of miles from the captain's battlefield, his wife is also fighting the Japs—with a rivet gun instead of a rifle, preaching all the while to her fellow-Americans that "there isn't much time—this isn't just a war, it's *the* war."

To Mrs. Francis Sauve, helping to build military airplanes in the Dallas plant of North American Aviation, Inc., every communique from the South Pacific war front is a message of terrible urgency. She knows that her husband, Capt. Bob Sauve, is there, fighting the onrushing tide of Japanese. And she knows, from years of pleasant living in the Dutch East Indies, that one of the "loveliest corners of the world is being ruthlessly despoiled."

When she read that the Dutch had blown up the big refinery at Palembang, Sumatra, it was as if one of the landmarks of her native Texas had been blown up in the face of the invaders. Mr. and Mrs. Sauve lived in Palembang

for more than six years. The man who is reported to have pulled the switch to demolish the refinery was their personal friend.

Her job as an aircraft factory worker is the only measure of personal vengeance Mrs. Sauve has been able to secure against the Japs. She wants to make the most of it.

Most disturbing to Mrs. Sauve since she returned to the United States from her former home in the East Indies is the complacency and smugness with which, she thinks, most Americans are viewing the war.

"They just don't seem to believe we are actually in a war, and not just *a* war, but *the* war. Well, I want to tell them this is *it*. It's not some serial they're hearing over a radio. A lot of other countries took the same attitude; they didn't wake up until it was too late. I know what I'm talking about, because I

have seen examples of the utter ruthlessness and barbaric destructiveness of the Japanese."

Mrs. Sauve is small and blond. Her eyes, a heritage from her Norwegian parents, are deep blue. Possessing a dynamic energy, her movements as she works are quick, sure. ("There isn't much

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*Above, Mrs. Francis Sauve operates a drill press at the Dallas plant, "to do something concrete" in the war. In Japanese dress at right, she holds two Balinese carved heads, part of her extensive collection.*



*Left—Balinese dancers at Denpasar perform a formal, graceful dance of religious significance. Today Denpasar is in Japanese hands.*





# NEARLY ALL TRADES ARE FOUND AT NAA



Above—Blacksmith F. E. Burton plies his trade in the Inglewood maintenance department.



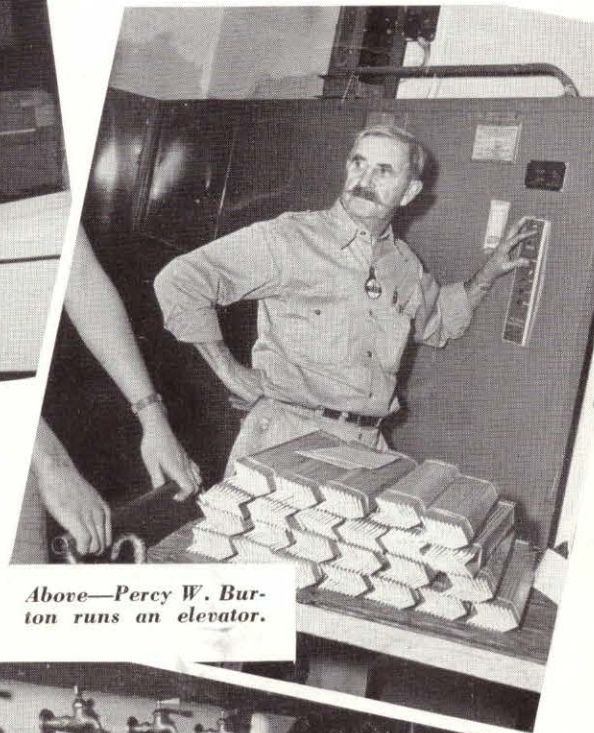
Above—Herbert C. Bailey tailors a canvas enclosure cover.



Above—This gentleman, so comfortably seated atop a B-25, is Radio Electrician Jasper Simpson, who is installing the antenna.



Above—Carpenter J. C. Petersen makes a table. At left below—Announcer L. M. Lowry is shown in his booth overlooking the Inglewood flight ramp. At right below—Plumber Maynard Cranstone takes care of a plugged drain pipe.



Above—Percy W. Burton runs an elevator.





# The Feminine Slant

By Kay Rutherford

REMEMBER? It was Paul Gallico, the noted writer, who startled the world several years ago with a widely copied article in *Vogue* telling how funny women looked when actively engaged in sports. We laughed, too, along with all the men, but we have always secretly wished we had a comeback. After reading the "Feminine Slant" in the January SKYLINE and seeing the pictures, we think we've got one. We're seriously tempted to send a copy of an old *Vogue* to Paul and make him eat every one of his derisive words, because the pictures of the NAA Dallas "Dianas" show a group of truly beautiful girls all gracefully engaged in a variety of sports.



This early in the game we can show few such pictures here at Kansas City. Just since late January have we been able to boast a recreational director, Carl Fox. Now that he's here and we've discovered that the U. S. O. and other service organizations are interested in

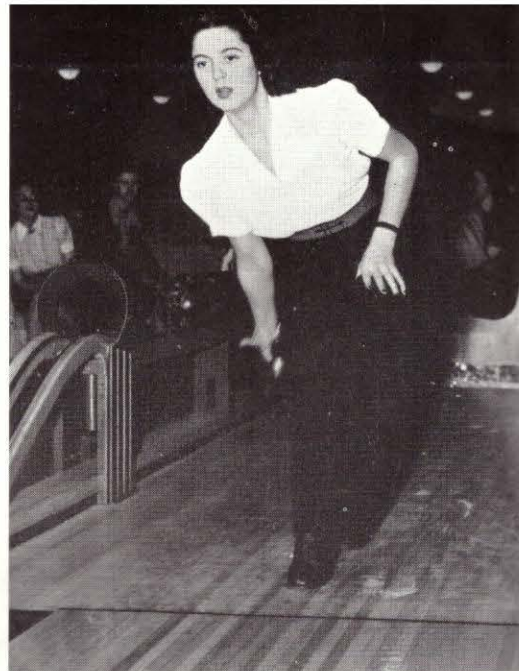
keeping women as well as men at war well and happy, we'll have no end of teams and activities. Already a group including Grace Zimmerman, Marion Roach, Ann Fanning, Nedene and Winifred Winters, Betty Flanders, Jean Page, Evelyn O'Donnell, Winifred Hammond, Joyce Johnson, Dorothy Peterson, Marjory and Mary Kay Goulding, and Betty Lou Stair has assembled to bowl every Monday night at the Esquire. From the appearance of things, they're going to be good.

★

There's a basketball team getting under way, too. We "took a gander" at the number signed up, and were astonished to see such a big turnout. Among the names were Leone Winans, Sophie Whitaker, Donis Duckers, Dixie Scott, and Mary Werrbach—not to mention at least ten more worthy women.

Before organization became the thing around here, we were not lacking in enterprising girls who filled their spare moments with interesting activities. Hulda Rhodes and her beautiful horses, which she shows herself, for years have been a feature at the American Royal Stock and Horse show. Last year she

*Whenever time permits, Private Pilot Hulda Rhodes steps across the street from the Kansas plant to the Rearwin hangar and adds a little more to her flying time.*



*If concentration means anything in bowling, Freda Hill got nothing less than a strike with this ball.*

turned her hand to flying, and now has a private license to show for her efforts.

Ice skating at the PlaMor on Monday nights when the Figure Skating club holds forth, we see Margaret Carey flash by on the arm of an admiring swain. The Winters sisters can also keep their poise and balance through "an outside edge" or a "three step." As a matter of fact, the Winters gals are good at all sports. We've been on the receiving end of Winifred's serve, and know from firsthand experience that it's a powerhouse.

★

We're doing our bit for defense, too—in more ways than helping to build B-25's. Our plant is within hailing distance of the 100 per cent mark in the sale of defense bonds, and the women are right in there pitching. We may be able to buy less jewelry and fewer cokes, but most of us are proud owners of bonds.

Soon we will have a Red Cross First Aid unit at the Kansas plant. We are all to be trained to react properly and to give useful aid in times of emergency. We hear the members of this unit will wear attractive uniforms—a swell idea, we think, knowing that a uniform will do as much for a woman as for a man and that each one will have a chance to work and feel she is actively contributing to our program of national defense.

The girls in the Inglewood unit already have very natty, light blue uniforms with both Red Cross and North American insignia. Here at Kansas City we're looking forward to getting similar ones.





# NAA Employees Buying Defense Savings Bonds by Pay Deduction

NOT content with very materially aiding the nation's defense effort by building pursuits, bombers, and training planes, employees at North American's three plants are making a further contribution by subscribing to NAA's payroll deduction plan for buying United States defense bonds.

The voluntary payroll deduction plan was inaugurated at Inglewood, Dallas, and Kansas City in January as a convenience to employees. The response was immediate. By late February several departments at each plant had reached the 100 per cent mark in bond buying, with many more nearing that point.

Under the plan, each North American employee may, if he so desires, authorize the company to make a regular monthly deduction from his salary or wages. The

minimum monthly deduction is three dollars, and all larger deductions, for convenience in bookkeeping, must be in multiples of one dollar. The only exception is in cases where the employee wishes to have the exact purchase price of a bond deducted each month.

Each employee designates the denomination of the bonds for which he is subscribing, the only qualification being that the bond size and deduction must be such as to result in a bond purchase within seven months.

When an employee's deductions amount to enough to purchase a bond, the company will purchase the bond, registering it in the name requested by the employee, and instruct the U. S. Treasury Department to deliver it to the address shown on the authorization form. The company will notify the employee when the purchase is made.

At Inglewood, nine departments had attained a 100 per cent rating by the middle of February, and 78 per cent of the plant's thousands of employees had

authorized the company to deduct from their salaries for the purchase of defense bonds.

At Dallas, where the city as a whole ranked eighth among all cities in the United States in the purchase of defense bonds at the time the payroll deduction plan went into effect, North Americans reflected the spirit of their community. In the first three weeks, more than 80 per cent of the Dallas employees had authorized bond deductions. The authorizations totaled \$881,379 a year in maturity value, and the Dallasites are aiming at bond deductions totaling more than \$1,000,000 annually.

At Kansas City, employees had subscribed 90 per cent by early January, but the rapid influx of new employees dropped the average to the low seventies. Last month, however, it again began to rise, and authorizations still continue to come in.

Inglewood employees are contributing to the Red Cross as well, by means of a voluntary lump sum payroll deduction plan, which was announced February 6. Red Cross deduction cards were distributed to employees at the California plant on February 10 and within two weeks 44 per cent had authorized the company to deduct from their pay checks for Red Cross contributions. Three departments held 100 per cent ratings.

## Inspection...

(From Page 14)

clips or other pieces riveted to it. (The jig has been inspected, too.) After the rattle of the rivet gun has died down, another inspector takes a careful look at the way it has been riveted.

Then our rib goes on to the nose sub-assembly jig (yes, that is constantly inspected) where the rib becomes an important part of the wing unit. Then it gets another inspection, from inside the airplane and out.

The rib, now part of a larger unit, moves to the master jig (you can depend on it—that gets plenty of inspection) where the trailing edge assembly is riveted on. More inspection follows, then final assembly, and our little rib is part of an entire airplane.

### Check and Double Check

This has been just a brief outline of the inspection life of one wing rib, which doesn't go through nearly so complicated a routine as some other parts do. But no airplane part, no matter how small, goes to help keep 'em flying without thorough testing, checking, and re-checking all the way down the line. The safety of a pilot may depend on that part, so it must be perfect. Inspection sees that it is.

If the sometimes-maligned inspector has a creed, it might be summed up like this: "If a part is made right, it fits and works properly. That eliminates bottlenecks and speeds production."

Mary Hogan, left, and Glendine Fuller are members of the Red Cross first aid unit at the Inglewood plant.





## B-25 First Army Plane To Sink Sub in Atlantic

Workers at Inglewood cheered last month when a plant news broadcast carried a press dispatch telling them that a North American B-25 Mitchell bomber had become the first U. S. Army warplane to sink a Nazi U-boat in the Atlantic.

The B-25A, on regular patrol duty February 5, first sighted a lifeboat carrying survivors of the China Arrow, tanker torpedoed 100 miles off the Atlantic Coast. The bomber's report resulted in the rescue of all 37 of the tanker's crew.

Later, the Mitchell's crew sighted a submarine, presumably that which had sunk the China Arrow, and bombed it into the heart of Davy Jones' locker.

## Education . . .

(From Page 13)

activity in this field at North American. Other educational work includes special courses pertaining to specific jobs. For example, the B-25 bomber, for production purposes, has been divided into a number of units, and special lectures are given to the groups which work on each of the production units.

As the need arises, intermittent instruction is also given in other specific subjects such as hydraulics, gun turret installation, and power plant installation and maintenance. The instruction is given to selected groups by technical experts, often, as in the case of engines and other purchased parts, by representatives of the manufacturing company.

Today, war conditions call for an even greater production effort than has been expended, and for North American, like other firms engaged in the manufacture of the materials of war, the shortage of skilled workers undoubtedly will continue to be one of the major problems. NAA's training program has been expanded many-fold during the past year, and this expansion continues, with the object of developing semi-skilled workers into skilled mechanics, and unskilled workers into semi-skilled workers, thus leaving room at the bottom for unskilled men to come in.

The primary consideration today is production. Tomorrow it will be more production. NAA's education departments are doing their share by training the men who will make that production possible.

## Kovsky . . .

(From Page 21)

second manifestation of that luck brought him the job at North American. He was in charge of the air conditioning system at a large Dallas department store, when plans for the construction of the North American plant near Dallas were announced.

"Sam," his boss said to him one day, "you're doing a good job, but you've gone as far here as you can go. If you stay here a hundred years, you'll still be doing just what you're doing now. You've got a lot of mechanical ability, and I'd like to see you make the most of it. Why don't you get into this new airplane work? Start night school now, and when this new factory opens, get a job there. I'll help you all I can."

So Sam went to a defense school, attending classes at night and working at his job during the day. For three months he went to school, and then on April 7, the day North American dedicated its new factory, Sam went to work in the machine shop as a drill press operator.

"I had my eye on this machine," he said, waving toward the big No. 4 turret lathe which he is now operating, "and I just kept bothering my foreman, asking him to put me on it, until he said O.K."

His foreman tells you that the transfer was no mistake, for Sam now is working with speed and skill on one of the most intricate and difficult parts made in the machine shop—the hydraulic selective valve. A piece of metal, honeycombed with holes, each of which must be of a perfect size and angle, the selective valve is no plaything for amateurs.

When all is going well, and the sometimes perverse gods which rule the machine world are in accord, Sam quite often turns out 30 selective valves a day. And the boys who know will tell you that that's a good day's work for anybody. Very definitely a good day's work.

★

## 'If You Can Fly a Harvard, You Can Fly a Spitfire'

Says Ronald Williams, aviation editor of the Toronto Star, writing in the Canadian Air Cadet for January:

"Except for difference in the speed of the service fighter and the Harvard trainer, there isn't much difference in flying them or in the cockpit drill, which consists of memorizing close to 50 operations and instrument and gauge checks before taking off. If you can fly a Harvard, says the Air Force, you can fly a Spitfire or Hurricane."

## Bradley . . .

(From Page 21)

handled rejections and material transfers in the material control department, later graduating into the flight department. From Douglas he moved to Vultee, where he was an important cog in the experimental flight department until coming to North American last year.

Jim Bradley has had ample opportunity to learn engines and maintenance — opportunity of which he has taken advantage. With his variety of experience and ability to see into and understand the "soul" of an airplane, he was the logical man to send as flight supervisor at North American's Kansas City plant.

Under his careful eye, the B-25's are prepared for flight and get their pre-flight inspection. The engines, the instruments—all are checked. And when Jim says the plane is ready, you can count on it. The plane is ready.

★

## Mrs. Sauve . . .

(From Page 26)

time. That is the thing I wish I could make everybody in America understand. There isn't much time.")

When she talks of that urgent necessity for speed, she speaks with tremendous earnestness, for her's is no second-hand knowledge.

Up until the Japs' attack on Pearl Harbor, her husband was a geophysicist with the N. K. P. M. Oil company in the East Indies. But he was also a reserve officer in the U. S. Army, and was called to active duty in the South Pacific war area shortly after war was declared. More than a year before that date, however, Mrs. Sauve, acting on instructions from her husband's company, instructions which foretold the war to come, left their home in Palembang, bound for the United States.

Only a short time ago, newspapers in big headlines told her of how the Japs attacked and laid waste Palembang, and she knows that her attractive house and all her possessions, except those few personal belongings which she was able to bring away with her, have been destroyed.

Her present job in the clatter and rush of an airplane factory is a far cry from the quiet, lazy life of the islands, where for a white person to do any sort of manual labor is to lose face with the natives. But she is relieved at last to have gone into action in the war, whose bitterness she knows so well.





# 1941 Report Introduces New NAA Fiscal Year

**W**AGES AND materials used in the construction of airplanes and parts drew the lion's share of every North American dollar during the last fiscal period, it is shown by a breakdown of figures in the annual stockholders' report issued recently.

The report covers the nine-month period from January 1 to September 30, 1941, rather than a full year, because as of 1941 the company changed the closing date of its fiscal (or bookkeeping) year from December 31 to September 30. The September to September period will correspond with a natural business year more closely than the calendar year does. Future reports will cover twelve-month periods from October 1 to September 30.

The 1941 report showed an income, for the nine-month period, of \$60,865,686.84 from the sale of airplanes and parts and other income of \$345,772.05. This latter figure included income from royalty and license agreements, interest and discounts, scrap sales, etc. The total of money coming in was \$61,211,458.89.

## Labor, Materials Biggest Item

Biggest expense item during the last fiscal year was the \$41,205,891.16 that went for labor, materials and purchased parts, and plant expenses, of which labor was the largest item. Plant expense did not include much of the cost of getting production under way in Dallas and Kansas City, because the two plants are owned by the government, and leased by North American. A certain amount of equipment and inventories at all three plants is also government-owned.

Taxes took another \$12,584,799.23 last year, of which nearly ten million went for federal income and excess-profits taxes. Income charges—interest, provision for contingencies, etc.—accounted for \$1,341,814.65 more.

During the 1941 fiscal period, the corporation declared a 75 cents a share dividend, which amounted in all to \$2,576,274.75, leaving as an operating surplus and as net income from the company's 1941 operations the sum of \$3,499,679.10, or 5.7 per cent of the gross income.


*This chart shows graphically where North American's income went during the 1941 fiscal period. The income charges mentioned separately in the text are included in the first item below.*

## WHERE NAA'S MONEY WENT LAST YEAR

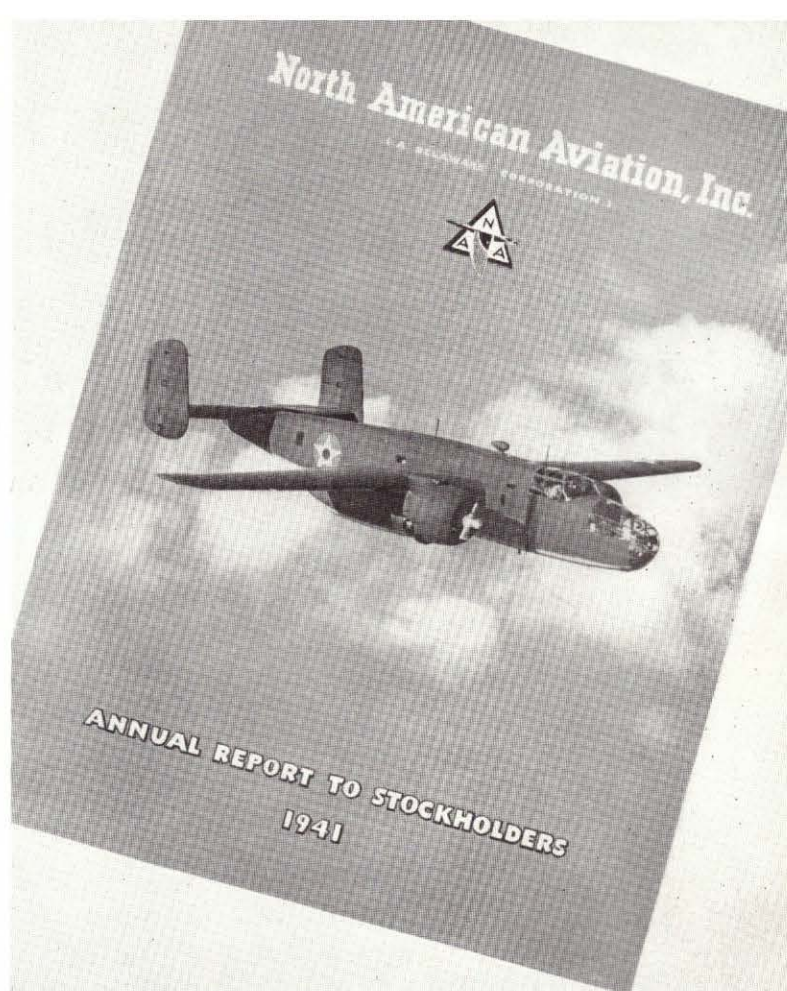
LABOR, MATERIALS, AND OTHER EXPENSES 

TAXES, FEDERAL AND STATE 

DIVIDEND PAID TO STOCKHOLDERS 

OPERATING SURPLUS AND INCOME 

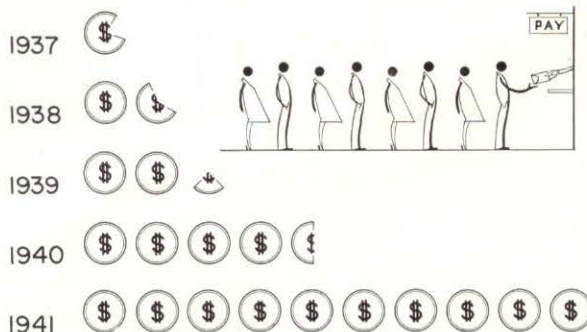
EACH SYMBOL REPRESENTS \$5,000,000  
FIGURES ARE FOR THE FISCAL YEAR, JANUARY 1 TO SEPTEMBER 30 1941



The 1941 report showed sales of airplanes and parts at an all-time high, due in part to the commencement and rapid acceleration of production at the Texas and Kansas plants. This increase in sales, however, was not paralleled by a proportional increase in net income. There were substantial rises in the costs, expenses, and other charges incidental to doing business, particularly in federal income and excess-profits taxes. The provision for such taxes in the 1941 fiscal period amounted to 62 per cent of the net income before taxes, as opposed to 30 per cent for the year 1940.

*North American's payroll has grown tremendously in the past five years. The pictorial graph below illustrates this in more striking fashion than any figures could.*

## HOW NORTH AMERICAN PAYROLL HAS GROWN



EACH SYMBOL REPRESENTS \$2,500,000



# Dallas Air Corps Representative, Major Ludick, Flew in Last War

**N**ORTH AMERICAN'S Dallas plant bade goodbye recently to Major Daniel B. White, Army Air Corps representative, and gave a typical Texas welcome to his successor, Major Roy E. Ludick. Major White, more recently promoted to a Lieutenant Colonel, was assigned to a new post in the Air Corps headquarters offices at Wright field, Dayton, Ohio.

Major Ludick came to Dallas a few months after he had been recalled into active service. He had been manager of the truck and passenger tire design department in the Goodyear Tire and Rubber company's Akron plant. Designing, testing, and production methods were some of the duties of his office. He had been with the tire and rubber firm since leaving active Air Corps service in the early 30's.

A flyer during the first World War, Major Ludick, then a lieutenant, was stationed on Long Island with the 352nd bombardment squadron. Hazelhurst, Mitchell, and Roosevelt fields are familiar names to him as most of his early flying time was spent in and around these fields. Before the bells rang and the whistles blew celebrating the signing of the Armistice, Lieutenant Ludick was wearing the double silver bars of a captain. In 1928 he received a major's gold leaves.

Familiar with the personnel types, plant layout, and manufacturing methods of Eastern and Midwestern organizations, Major Ludick expressed surprise when he was first escorted through the Dallas plant.



*Major Roy E. Ludick, who succeeded Major (now Lieutenant Colonel) Daniel B. White, at Dallas.*

"The apparent youthfulness and enthusiasm shown by these workers and the amazing production records which I have already examined are definitely a tribute to your methods of teaching," Major Ludick said.

The quiet, soft-spoken, and sincere airman quickly received willing cooperation from all parts of the Dallas organization, and he himself has shown that he knows what cooperation means.

Major Ludick, Mrs. Ludick, and their 13-year-old daughter, Janet, are now living in Dallas, where the family are rapidly becoming "native" Texans.

## Machine Shop Typifies Dallas Spirit ...

(From Page 23)

fall before was playing a bruising, top-notch brand of football at guard and tackle for Oklahoma university. Another young man in the plant spent 1939 and 1940 operating the air-conditioning unit which kept Gargantua, the Ringling Brothers, Barnum and Bailey circus' prized gorilla, in good health. How did he get here?

"Well, Dallas was my home. I was tired of jumping about over the country. I had had a little mechanical experience, so when I heard they were starting an airplane factory here, I packed up and headed this way."

A licensed embalmer operates one of the machines. The operator of another not so long ago was making his living by catching alive and selling dangerous Texas rattlesnakes. At his elbow is a former professional magician.

So it goes. From the tool makers, the aristocrats of the shop—and that's one place where there is no substitute for experience—to the stock runners, they tell stories of the past as varied as the individuals themselves. But their stories now have converged to become a single story, a story of achievement—the Dallas Story.

## Flight Test ...

(From Page 4)

to the model number, as in B-25, B-25B, B-25C, etc.—may consist of different engines or of a change in armoring or armament, all of which change the flight characteristics of the plane, although to varying degrees.

Flying military aircraft is a familiar routine to three of NAA's engineering test pilots. Wait, Virgin, and Chilton are graduates of the Army Air Corps Advanced Flying school at Kelly field, Texas. Penrose, who with Chilton started with North American as a ferry pilot, is a former transport pilot.

### Test Pilot for 11 Years

Wait attended Marquette university, where he studied mechanical engineering, and then went into the Air Corps. He was graduated from Kelly field in 1930 and has been engaged in flight test work ever since. Before coming to North American four years ago, he worked for Boeing for seven years. While there, he made the first flight in the prototype of the familiar B-17 or Flying Fortress series.

Virgin, bomber test pilot, was graduated from Alabama Polytechnic Institute with a degree in mechanical engineering, and in 1934 was commissioned a second lieutenant at Kelly field. He served in a bombardment squadron for four years and is still a first lieutenant in the Air Corps Reserve. He came to North American in January, 1938, as Air Corps inspector and started flight testing for the company February 7, 1941.

Chilton, who specializes in pursuits, is a graduate of the University of Oregon and, in 1938, of the Air Corps school at Kelly field. He saw active duty with the 79th pursuit squadron before becoming an instructor at the Army's primary flying school at Santa Maria, California. In January, 1940, he went to work for North American, ferrying Harvard trainers to Canada. In March, 1941, he joined engineering flight test.

### Former Weather Pilot

Penrose learned to fly in 1934, when he was attending high school in Salt Lake City. By 1936, he had his transport license and was working for a private flying school as a weather observation pilot, taking readings for the government. After flying a year for a private transport company, he came to North American in November, 1940, as a ferry pilot flying Harvards to Canada. He went to the Dallas plant last July, then came to engineering flight test at Inglewood on January 1 of this year.



# PLANT SAFETY+

**I**N WAR TIME, it is obvious that the accident and injury monster, which last year caused 100,000 fatalities in American industry—equivalent to eight Army divisions—and cost \$3,500,000,000, is as much an aid to the enemy as his Stuka dive bombers, his Messerschmitts, and other war weapons.

That we must bring renewed vigor into the battle against this monster, which last year cost enough lost man-hours to have built 45 battleships or 375 destroyers or 75,000 fighter planes or 30,000 medium bombers or 15,000 heavy bombers, is equally obvious.

To focus attention of foreman and employe alike on the vital importance of this battle at the Dallas NAA plant, and further to draw attention specifically to those points where accidents are occurring, weekly summaries of accidents and injuries are now being sent out to each department.

## Experiment Successful

The practice of distributing this weekly summary to foremen was started late in November, and C. B. Rodgers, safety engineer, believes his department has tried the experiment sufficiently long and has obtained such good results from it as to pronounce it a complete success. It has been of great value, not only in stimulating interest, but in localizing accidents, the first step in their elimination.

Moreover, it gives each department a clear picture of its accident and injury record and a comparison with the records of other departments. Also on the report is the record for the previous week, in order that the department may see whether or not it is improving.

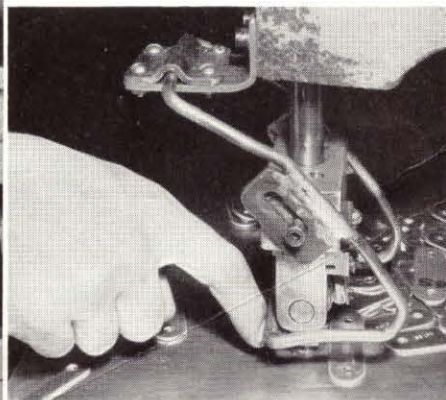
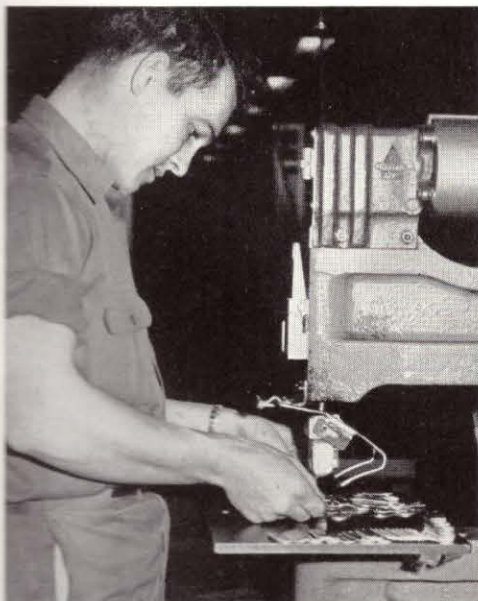
The summary goes to the executives of the company as well as to each department. It is broken down, for the particular department to which it goes, to include: the total number of injuries for the week immediately past and the preceding week in that department; type of accident and injury; the number of "lost-time" accidents; the total man-hours lost; and a comparison with the accident and injury record for the plant as a whole.

Since women have been employed in the plant, the report has been changed to show a complete and separate record on both men and women. Foremen, safety committeemen, and the safety department make a study of these summaries each week, and the necessary steps are taken to correct conditions causing the accidents.

## Summary Is Posted

In addition, either the summary is posted on the bulletin board in the department, or the safety committeeman in the department takes it to each employe in order that all might have an opportunity to see it.

*Dallas Leadman Herrol Bellomy demonstrates the finger guard he made for this stamping machine. The large picture shows the guard withdrawn when the stamp is raised. The closeup shows how the guard comes forward when the stamp falls to keep fingers out of danger.*



*Clarence E. Leach, left, machine shop foreman, and Safety Committeeman Ralph E. Sanderlin confer on the weekly accident summary.*

Complete cooperation by the medical department makes this type of report possible. For this summary, the medical department makes a separate record giving full details on each injury. A daily report of the total number of, and type of, injuries is sent to the safety department.

Some departments are even keeping a check on the name of each person injured and the particular type of accident which caused his injury. All of this has had a most salutary effect in obtaining employe participation in the constant battle against accident and injury.

Indicative that interest in accident prevention has increased is the fact that some departments, on their own initiative, are now holding intra-departmental safety contests among themselves.

## Eye Injuries Decrease

For a time, eye injuries were one of the big problems at Dallas. In September, 1941, NAA launched a campaign to reduce this type of injury. Goggles and face shields were made available at every tool crib, and employes were encouraged to use them. Floodlight eye-shields which could not be removed from the machine were placed on grinders throughout the plant. This and the constant effort of safety committeemen in each department have reduced the eye injuries from 22 per cent of all those reported to the medical department in September, to 13 per cent at the end of December.

Much interest has been stimulated, too, by the monthly award of a safety trophy to the department achieving the best accident record. Departments winning the award last year were January, 4; February, 6; March, 8; April, 10; May, 14; June, 19; July, 20; August, 62; September, 71; October, 15; November, 13; and December, 59.